This document provides pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a minor, industrial permit. The discharges result from stormwater runoff, groundwater, steam condensate, cooling water and firewater from a cellulose derivatives facility operation. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective 6 January 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained within this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	Hercules Incorporated Aqualon Division 1111 Hercules Road Hopewell, VA 23860	SIC Code:	2869 Industrial Organic Chemicals
	Facility Location:	1111 Hercules Road Hopewell, VA 23860	City:	Hopewell
	Facility Contact Name:	Steve Spence / EH&S Manager	Telephone Number:	804-541-4506
	Facility Email Address:	sgspence@ashland.com		
2.	Permit No.:	VA0003492	Expiration Date:	23 February 2010
	Other VPDES Permits:	Not Applicable		
	Other Permits:	VWP 96-1191 Registration No. 50363 – Air Permit Registration No. 871 – Virginia TSCA ID No. 4004641 – Petroleum Tank Registration (UST/AST) HRWTF #4 – Industrial Pretreatment VAD003121928 – EPA RCRA Corrective Action (groundwater mitigation)		
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	Hercules Incorporated, Aqualon Division		
	Owner Contact / Title:	Paul Tuck / Plant Manager	Telephone Number:	804-541-4400
	Owner Email Address:	ptuck@ashland.com		
4.	Application Complete Date:	3 September 2009		
	Permit Drafted By:	Douglas Frasier – NRO	Date Drafted:	25 July 2013 1 November 2013 19 November 2013
	Draft Permit Reviewed By:	Alison Thompson – NRO	Date Reviewed:	6 August 2013
		Emilee C. Adamson – PRO	Date Reviewed:	13 October 2013
			Date Reviewed:	15 November 2013
	Public Comment Period:	Start Date: TBD 2013	End Date:	TBD 2013
5.	Receiving Waters Information:	See **Attachment 1** for the Flow Frequency Determination and 303(d) Status.		
	Receiving Stream Name:	Bailey Creek – Outfall 005 and Outfall 006		
	Drainage Area at Outfall:	17.58 square miles	River Mile:	2-BLY001.76
	Stream Basin:	James River (Lower)	Subbasin:	None
	Section:	1	Stream Class:	II
	Special Standards:	a, z, bb and ESW-11	Waterbody ID:	VAP-G03E
	7Q10 Low Flow:	1.2 MGD	7Q10 High Flow:	4.2 MGD
	1Q10 Low Flow:	1.1 MGD	1Q10 High Flow:	4.0 MGD
	30Q10 Low Flow:	1.7 MGD	30Q10 High Flow:	5.0 MGD
	Harmonic Mean Flow:	Undetermined	30Q5 Flow:	2.2 MGD

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

✓	State Water Control Law		EPA Guidelines
✓	Clean Water Act	✓	Water Quality Standards
✓	VPDES Permit Regulation		Other:
✓	EPA NPDES Regulation		

7. Licensed Operator Requirements: Not Applicable

8. Reliability Class: Not Applicable

9. Facility/Permit Characterization:

✓	Private	✓	Effluent Limited		Possible Interstate Effect
	Federal	✓	Water Quality Limited		Compliance Schedule
	State		Whole Effluent Toxicity Program		Interim Limits in Permit
	WTP		Pretreatment Program		Interim Limits in Other Document
	eDMR Participant	✓	TMDL		

10. Facility and Outfall Descriptions:

The Hercules Aqualon facility is located in the eastern part of the City of Hopewell; encompassing approximately 390 acres. The facility employs approximately 250 people and operates 24 hours a day, year round. Hercules purchased the property in 1926 but the site has been used for industrial purposes since 1912 under various owners/operators. The Hercules Hopewell Plant is involved in the manufacture of carboxymethylcellulose (CMC), hydroxyethylcellulose (Natrosol®), ethylcellulose (EC), hydroxypropylcellulose (Klucel®), fluidized polymer suspension (FPS) and monochloroacetic acid (MCA).

See **Attachment 2** for the NPDES Permit Rating Worksheet.

Outfalls 005 and 006, as described in Table 1, receive groundwater, steam condensate, cooling water and firewater (i.e. non-stormwater sources) from the facility during dry weather. The groundwater and firewater sources would not be considered process wastewaters since these sources are not the result of the production of the aforementioned materials. The wastewater generated from the production processes are routed to the pretreatment plant prior to being conveyed to the Hopewell Wastewater Treatment Facility (VA0066630) for final treatment.

The groundwater mitigation and subsequent discharges have been monitored under a Resource Conservation and Recovery Act (RCRA) Corrective Action program under the oversight of the Environmental Protection Agency and DEQ. Pollutants of concern identified in the groundwater include volatile organic compounds (VOCs), alcohols and inorganics based on the project screening criteria Maximum Contaminate Level (MCL) for National Primary Drinking Water Standards or the April 2003 USEPA Region III Risk-based Concentration when a MCL was not available). The majority of these contaminates were detected in monitoring wells located at significant distances from the discharge point to surface waters and not in the groundwater prior to entry to the hyporheic zone directly adjacent to the receiving surface water body. A hyporheic zone is the region beneath and alongside the stream bed; mixing zone of shallow groundwater and surface water. The groundwater contaminate concentrations at the hyporheic zone are expected to be significantly lower (one to two orders of magnitude) due to the effects of dilution from the advection/dispersion/diffusion transport processes. The pollutants of concern are either significantly reduced and/or do not pose impacts to the receiving stream or downstream designated uses. See **Attachment 3** for a copy of the RCRA Corrective Action Report.

Outfalls 905 and 906 were designated as stormwater outfalls during the last reissuance. The point of compliance for these two outfalls was located at Outfalls 005 and 006, respectively. However, it is likely that during a wet weather event, non-stormwater and stormwater sources would comingle at these locations; thus, it is not representative of only stormwater at either outfall. It is staff's best professional judgement that Outfall 905 and Outfall 906 be removed with this reissuance based on this assumption. It is proposed that monitoring during wet weather events be merged into the requirements at Outfall 005 and Outfall 006. This will essentially obtain the same information while placing fewer burdens on plant staff, eliminates duplicate sampling at the same outfall and still ensures the receiving stream is protected at all times.

According to the previous permit, Internal Outfall 601 was designated as a stormwater discharge point. This internal outfall discharges to Outfall 906, which is Outfall 006 during dry weather events. It was staff's best professional judgement during the last reissuance that the facility monitor at this outfall to determine if there was any direct influence on the characteristics measured at Outfall 906 during wet weather events. A review of the effluent data reported during the previous permit term provided no conclusive evidence of this; therefore, it is proposed that Internal Outfall 601 be removed with this reissuance. Monitoring will be conducted at Outfall 006, which will include wet weather sampling requirements.

Outfall 013 was designated as the overflow point for the inert debris landfill sedimentation basin. There has been no discharge from this outfall for at least the last two (2) permit terms. This may be the result of improved vegetative growth and no activity at this landfill. There are no plans to utilize this landfill as the facility transports debris to a local landfill. In addition, the sedimentation basin contained vegetative growth (evidence that it has not held stormwater in sufficient amounts for any time period) and the height of the riser (outlet pipe) does not lend to a discharge occurrence (see **Attachment 5** for photos from the 11 July 2013 site visit). Given the aforementioned, it is staff's best professional judgement the monitoring requirements be removed with this reissuance. This outfall shall be governed by best management practices. If the landfill would be utilized in the future, reinstatement of the monitoring requirements would be warranted. See Sections 19.c. and 21.g. of this Fact Sheet.

Table 1 provides a list of monitored outfalls; Table 2 lists outfalls recognized and authorized to discharge under this permit and are governed by best management practices; and Table 3 lists stormwater intakes from adjoining properties that may or may not affect this facility.

TABLE 1
MONITORED OUTFALL DESCRIPTION

Outfall Number	Discharge Sources	Estimated Flow	Latitude Longitude
005	Groundwater/steam condensate	0.02 MGD	37° 16′ 50″ 77° 16′ 32″
	Firewater	0.1 MG	
	Run-on from Intake 007	0.01 MG	
	Stormwater runoff	0.002 MGD	
006	Groundwater/steam condensate	0.003 MGD	37° 16′ 55″ 77° 16′ 17″
	Ethylene Oxide/Propylene Oxide Tanks Cooling Water	0.05 MG/event	
	Groundwater from Outfall 001 and head of Outfall 002 ditch	0.003 MGD dry weather 0.03 MG/rain event	
	White Water Lagoon overflow	2,000 GPD dry weather	
	Stormwater Lift Station	0.001 – 0.05 MG/event	
	Stormwater runoff	0.04 MG/event	

TABLE 2
RECOGNIZED OUTFALLS
GOVERNED UNDER THE STORMWATER MANAGEMENT PLAN

Outfall Number	Discharge Sources
001	Former Chemical Cotton Process Area
002	Former Chemical Cotton Process Area & Warehouse Areas (includes internal outfalls 014, 015, 016 and 017)
010	Unimproved area north of former Aquasorb Process Area
011	Former Aquasorb Process Area
012	Wildlife Habitat Area (former solid waste incinerator & landfill areas)
013	Stormwater overflow from Inert Debris Landfill Sedimentation Basin
018/019/020	Wildlife Habitat & former Warehouse Area
022	Former Caustic-Chlorine Process Area
025	Wildlife Habitat Area (former landfill area)
027	Former wastewater treatment area

TABLE 3 STORMWATER RUN-ON FROM ADJOINING PROPERTIES	
Intake Number	Discharge Sources
007	Runoff from S.C.L. Railroad Property – outlet pipe designated as Outfall 009
008	Runoff from S.C.L. Railroad Property
009	Outlet pipe for Intakes 008 & 028
021	Runoff from Cogeneration Facility
028	Runoff from S.C.L Railroad Property – outlet pipe designated as Outfall 009

See **Attachment 4** for the Hopewell topographic map.

11. Solids Treatment and Disposal Methods:

This facility does not generate nor treat sewage sludge.

12. Discharges Located Within Waterbody VAP-G03E:

TABLE 4 DISCHARGES WITHIN WATERBODY VAP-G03E			
Permit Number	Facility Name	Type	Receiving Stream
VA0004642	RockTenn CP LLC - Hopewell	Minor Industrial Individual Permits	James River
			Gravelly Run, UT
			Gravelly Run
VA0082783	Dominion - Hopewell Power Station		Poythress Run
			Gravelly Run, UT
VA0073300	James River Genco LLC		Gravelly Run
VA0005291	Honeywell International Incorporated – Hopewell	Major Industrial Individual Permit	Poythress Run
			Gravelly Run
VA0066630	Hopewell Wastewater Treatment Plant	Major Municipal Individual Permit	Gravelly Run
VAR051497	Airgas Carbonic Dry Ice – Hopewell	Stormwater Industrial General Permits	James River
VAR051198	Jordan Point Yacht Haven		James River
VAR051450	Hopewell Wastewater Treatment Plant		Gravelly Run
VAG404271	Glen Cove Subdivision Lot 12	Small Municipal $\leq$ 1,000 gpd General Permits	James River, UT
VAG404114	Townes H Carlton & Patricia R Residence		James River
VAG404199	Wurdeman John & Kathleen Residence		James River
VAG404270	Glen Cove Subdivision Lot 1		James River, UT

13. Material Storage:

Ethylene oxide and propylene oxide tanks are stored outside, under roof in an earthen berm enclosed area. All other chemicals are stored under roof. Floor drains are routed to the industrial sewer pipes which discharge to the Hopewell Regional Wastewater Treatment Facility (VA0066630). Table 5 provides the materials stored at each process location.

TABLE 5 MATERIAL STORAGE	
Process Area	Materials Description
CMC / FPS	cellulose, acetic acid, alkali cellulose, hydrogen peroxide, isopropyl alcohol, chloroacetic acid, sodium acetate, sodium chloride, sodium glycolate, sodium hydroxide, ammonia, tall oil, mineral oil
EC / MCA	cellulose, acetic acid, alkali cellulose, diethyl ether, ethyl alcohol, ethyl chloride, ethylene glycol, hydrochloric acid, sodium hypochlorite, monochloroacetic acid, sodium acetate, sodium chloride, sodium hydroxide
Klucel	cellulose, acetic acid, alkali cellulose, heptanes, hydrogen peroxide, nitric acid, propylene oxide, propylene glycol (and polypropylene glycols), sodium acetate, sodium glycolate, sodium chloride, sodium hydroxide, tertiary butyl alcohol
Natrosol	cellulose, acetic acid, alkali cellulose, diacetone alcohol, ethylene glycol (and polyethylene glycols), ethylene oxide, hydrogen peroxide, isopropyl alcohol, chloroacetic acid, nitric acid, sodium acetate, sodium glycolate, sodium hydroxide, tertiary butyl alcohol, sulfuric acid, n-butylglycidyl ether

14. Site Visit: Performed by Douglas Frasier on 11 July 2013.
See **Attachment 5** for the 31 March 2010 Compliance Inspection Report which reflects the July 2013 observations.

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

The nearest DEQ monitoring station, 2-BLY000.65, is located on Bailey Creek at the Route 10 bridge; approximately 1.11 miles downstream of the confluence with West Bear Creek. See **Attachment 6** for ambient hardness, ph and temperature data as recorded at the aforementioned monitoring station.

During the 2010 and draft 305(b)/303(d) Integrated Water Quality Assessments, tidal Bailey Creek was assessed as a Category 5D water. The Water Quality Standard is not attained where Total Maximum Daily Loads (TMDLs) for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.

The Aquatic Life Use is impaired due to inadequate submerged aquatic vegetation (SAV) and dissolved oxygen in the lower James River tidal freshwater estuary as well as pH exceedances in Bailey Creek. The proposed permit contains pH limitations to address the pH exceedances; therefore, the discharges associated with this facility should neither cause nor contribute to this noted impairment.

In addition, ammonia exceedances, excessive algal growth and sediment exceedances for mercury, polychlorinated biphenyls (PCBs) and chlordane are considered non-impairing observed effects.

The Recreation Use is impaired due to *E. coli* violations. Bailey Creek is located within the study area for the James River – Hopewell to Westover Bacterial TMDL, which was approved by the EPA on 10 July 2008 and by the State Water Control Board (SWCB) on 28 April 2009. Hercules was modeled in the TMDL; however, the facility is not permitted for fecal coliform control and was not assigned a wasteload allocation.

The Fish Consumption Use is impaired due to PCBs in fish tissue; arsenic and kepone are observed effects.

It is staff's best professional judgement that this facility is not a source of PCBs and this was subsequently confirmed by sampling data submitted with the reissuance application; therefore, discharges associated with this facility should neither cause nor contribute to the aforementioned Fish Consumption Use impairment.

The Wildlife Use is considered fully supporting with observed effects due to ammonia exceedances.

This facility discharges to Bailey Creek in the Chesapeake Bay watershed in the lower tidal freshwater James River estuary (JMSTF1). The receiving stream has been addressed in the Chesapeake Bay Total Maximum Daily Load (TMDL); approved by the Environmental Protection Agency (EPA) on 29 December 2010.

The TMDL addresses dissolved oxygen (DO), chlorophyll a and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tidal tributaries by establishing non-point source load allocations (LAs) and point-source waste load allocations (WLAs) for total nitrogen (TN), total phosphorus (TP) and total suspended solids (TSS) to meet applicable Virginia Water Quality Standards contained within 9VAC25-260-185.

The Chesapeake Bay TDML implementation is currently administered in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP); approved by EPA on 29 December 2010. The approved WIP recognizes the *General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia*, 9VAC25-820 et seq., as governing the nutrient allocations for non-significant Chesapeake Bay dischargers. Nutrient WLAs for non-significant industrial facilities were based on estimated TN and TP load levels obtained from Discharge Monitoring Report data and typical effluent concentrations established by Standard Industrial Classification (SIC) codes.

The TN and TP wasteload allocations contained within the WIP are considered aggregate allocations and are not included in individual permits for these types of facilities. All non-significant discharges with individual permits in existence as of 1 July 2005 are covered by rule under the watershed general permit. New or expanding facilities will be required to register under the watershed general permit as established under the Code of Virginia and will be assigned individual wasteload allocations as applicable. Similarly, the WIP also considers total suspended solids (TSS) WLAs for non-significant facilities to be aggregate allocations. TSS limits will be included in individual permits as required by technology-based requirements of the Clean Water Act. However, as long as the aggregated TSS permitted loads for all dischargers is less than the aggregate TSS load in the WIP, the individual permit will be considered consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. This facility is classified as a non-significant Chesapeake Bay discharger because it has a permitted equivalent load of less than 100,000 gallons per day into tidal waters. This facility has not applied for a new or expanded discharge; therefore, it is covered by rule under the 9VAC25-820 regulation.

Total nitrogen, total phosphorus and total suspended solids load limits are not included in this individual permit. Based on staff's review of data reported during the last permit term and the application, this individual permit is in conformance with the aforementioned requirements; therefore, consistent with the Chesapeake Bay TMDL. Implementation of the full Chesapeake Bay WIP, including GP reductions combined with actions proposed in other source sectors is expected to adequately address ambient conditions such that the requirements of this individual permit are consistent with the Chesapeake Bay TMDL and will not cause an impairment or observed violation of the standards for DO, chlorophyll a or SAV as required by 9VAC25-260-185.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 6
INFORMATION ON DOWNSTREAM 303(d) IMPAIRMENTS AND TMDLs

Waterbody Name	Impaired Use	Cause	TMDL completion	Wasteload Allocation (WLA)	Basis for WLA
James River	Aquatic Life	Nutrients Dissolved Oxygen	Yes – 2010	Total Nitrogen Total Phosphorus Total Suspended Solids	Aggregated loads for non-significant wastewater dischargers. Nutrient allocations administered via the Watershed Nutrient General Permit. Aggregate TSS allocations established on technology-based limits of 30mg/L.
James River	Fish Consumption	PCBs	No – 2014	NA	NA
Bailey Creek & Cattail Creek	Fish Consumption	PCBs	No – 2024	NA	NA
	Recreation	*E. coli*	Yes – 2008	None	Not expected to discharge pollutant of concern.

The full planning statement and 2012 303(d) Fact Sheets can be found in **Attachment 1**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream Bailey Creek is located within Section 1 of the James River Basin and classified as Class II water.

Class II tidal waters in the Chesapeake Bay and it tidal tributaries must meet dissolved oxygen concentrations as specified in 9VAC25-260-185 and maintain a pH of 6.0 – 9.0 standard units as specified in 9VAC25-260-50. Class II waters must meet the Migratory Fish Spawning and Nursery Designated Use from February 1 through May 31. For the remainder of the year, these tidal waters must meet the Open Water use. The applicable dissolved oxygen concentrations are presented in Table 7 below.

TABLE 7
DISSOLVED OXYGEN CRITERIA
9VAC25-260-185

Designated Use	Criteria Concentration/Duration	Temporal Application
Migratory fish spawning and nursery	7-day mean > 6 mg/L (tidal habitats with 0-0.5 ppt salinity)	February 1 – May 31
	Instantaneous minimum > 5 mg/L	
Open-water[1]	30-day mean > 5.5 mg/L (tidal habitats with 0-0.5 ppt salinity) 30-day mean > 5 mg/L (tidal habitats with > 0.5 ppt salinity)	Year – round[2]
	7-day mean > 4 mg/L	
	Instantaneous minimum > 3.2 mg/L at temperatures < 29° C Instantaneous minimum > 4.3 mg/L at temperatures > 29° C	
Deep-water	30-day mean > 3 mg/L	June 1 – September 30
	1-day mean > 2.3 mg/L	
	Instantaneous minimum > 1.7 mg/L	
Deep-channel	Instantaneous minimum > 1 mg/L	June 1 – September 30

[1] In applying this open water instantaneous criterion to the Chesapeake Bay and its tidal tributaries where the existing water quality for dissolved oxygen exceeds an instantaneous minimum of 3.2 mg/L, that higher water quality for dissolved oxygen shall be provided antidegradation protection in accordance with 9VAC25-610-30.A.2.

[2] Open-water dissolved oxygen criteria attainment is assessed separately over two time periods: summer (June 1 – September 30) and non-summer (October 1 – May 31) months.

Attachment 7 and **Attachment 8** details other water quality criteria applicable to the receiving stream at Outfall 005 and Outfall 006, respectively.

Ammonia:

The fresh water, aquatic life Water Quality Criteria for Ammonia is dependent on the effluent and/or instream pH and temperature. The 90th percentile pH and temperature values are utilized since they best represent the critical conditions of the receiving stream. See **Attachment 6** for the ambient pH and temperature data recorded at DEQ monitoring station 2-BLY000.65. Monitoring data for March 2005 – December 2012 provided pH values for the outfalls (**Attachment 9**). Since temperature data was not readily available, staff utilized a default temperature of 25° C for summer and an assumed value of 15° C for winter.

Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent hardness values (expressed as mg/L calcium carbonate). The average hardness of the receiving stream is 53 mg/L $CaCO_3$, based on 2005 – 2006 ambient stream data (**Attachment 6**). Even though this data is 8 years old, staff believes that these hardness values still accurately characterize the receiving stream and may be utilized to ascertain the criterion. The monitoring data for Outfall 005 and Outfall 006 indicated average values of 190.5 mg/L and 220.4 mg/L, respectively based on March 2005 – December 2012 monitoring data presented in **Attachment 9**.

The hardness-dependent metals criteria in **Attachment 7** and **Attachment 8** for Outfall 005 and Outfall 006, respectively, are based on the aforementioned hardness values.

Bacteria Criteria:

The Virginia Water Quality Standards at 9VAC25-260-170.A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 mL of water shall not exceed the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 mL)	126

[1]For a minimum of four weekly samples taken during any calendar month

It is staff's best professional judgement that *E. coli* bacteria is not expected to be present within these industrial discharges at any outfall; therefore, limitations are not applicable to this facility.

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Bailey Creek, is located within Section 1 of the James River Basin. This section has been designated with special standards "a", "z", "bb" and "ESW-11".

The receiving stream has been designated with a special standard of "a". According to 9VAC25-260-310.a, Special Standard "a" applies to all open ocean or estuarine waters capable of propagating shellfish or in specific areas where public or leased private shellfish beds are present, including those waters on which condemnation or restriction classifications are established by the State Department of Health. The fecal coliform bacteria standard is as follows: the geometric mean fecal coliform value for a sampling station shall not exceed an MPN (most probable number) of 14 per 100 milliliters of sample and the 90th percentile shall not exceed 43 for a 5-tube, 3-dilution or 49 for a 3-tube, 3-dilution test. The shellfish are is not to be so contaminated by radionuclides, pesticides, herbicides or fecal material that the consumption of shellfish might be hazardous. This same standard is also contained in 9VAC25-260-160. Fecal Coliform Bacteria; Shellfish Waters. This standard is used for the interpretation of instream monitoring data and not for setting fecal coliform effluent limitations.

This special standard is not applicable to this facility since it does not discharge the pollutant of concern in appreciable amounts.

Special Standard "z" is a site specific dissolved copper aquatic life criterion of 16.3 µg/L for protection from acute effects and 10.5 µg/L for protection from chronic effects applies in the following areas:

- Little Creek to the Route 60 (Shore Drive) bridge including Little Channel, Desert Dove, Fishermans Cove and Little Creek Cove.

- Hampton Roads Harbor including the waters within the boundary lines formed by I-664 (Monitor-Merrimac Bridge Tunnel) and I-64 (Hampton Roads Bridge Tunnel), Willoughby Bay and the Elizabeth River and its tidal tributaries.

- This criterion reflects the acute and chronic copper aquatic life criterion for saltwater in 9VAC25-260-140.B multiplied by a water effect ratio. The water effect ratio was derived in accordance with 9VAC25-260-140.F.

This special standard applies further downstream on the James River near Norfolk; thus, is not applicable to this discharge.

Special Standard "bb" refers to a site specific numerical chlorophyll a criteria that is applied March 1 through May 31 and July 1 through September 30 as seasonal means to the tidal James River (excludes tributaries) segments JMSTF2, JMSTF1, JMSOH, JMSMH and JMSPH and are implemented in accordance with subsection D of 9VAC25-260-185.

This special standard is addressed by the Chesapeake Bay Total Maximum Daily Load (TMDL).

Special Standard "ESW-11" designates surface waters, or portions of, which provide exceptional environmental settings and exceptional aquatic communities or exceptional recreational opportunities. No new, additional or increased discharge of sewage, industrial wastes or other pollution into designated waters shall be allowed.

Bailey Creek is not part of the exceptional waters cited in 9VAC25-260-30.A.3.c.(11); thus, is not applicable to this discharge.

e. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on 25 June 2013 for records to determine if there are threatened or endangered species in the vicinity of the discharge.

The following threatened or endangered species were identified within a 3 mile radius of the discharge: red-cockaded woodpecker (*Picoides borealis*); Atlantic sturgeon (*Acipenser oxyrinchus*); blackbanded sunfish (*Enneacanthus chaetodon*); black rail (*Laterallus jamaicensis*); Rafinesque's eastern big-eared bat (*Corynorhinus rafinesquii macrotis*); peregrine falcon (*Falco peregrines*); upland sandpiper (*Bartramia longicauda*); loggerhead shrike (*Lanius ludovicianus*); green floater (*Lasmigona subviridis*); migrant loggerhead shrike (*Lanius ludovicianus migrans*). The proposed limits within this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

The stream that the facility discharges to is within a reach identified as having an Anadromous Fish Use. It is staff's best professional judgment that the proposed limits are protective of this use.

In addition, the Virginia Department of Conservation and Recreation was coordinated during this reissuance per the procedures as set forth in the 2007 Memorandum of Understanding (MOU) concerning Threatened and Endangered Species Screening for VPDES Permits. The purpose of this coordination is to obtain input from other agencies during the permitting process to ascertain potential adverse impacts to threatened and endangered species and/or their habitats.

Any comment from this agency is noted in Section 26 of this Fact Sheet.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on surrounding industrial activity and the noted downstream aquatic life and fish consumption impairments (Section 15). It is staff's best professional judgment that such streams are Tier 1 since the limits are set to meet the Water Quality Standards. The proposed permit limits have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the agency established quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLAs) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations.

Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are then calculated on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

a. Effluent Screening

Monitoring data obtained from the permit application, Attachment A sampling and the February 2005 – December 2012 Discharge Monitoring Reports (DMRs) has been reviewed and determined to be suitable for evaluation.
Please see **Attachment 9** for a summary of discharge monitoring data.

The following pollutants require a wasteload allocation analysis: copper, nickel, silver and zinc.

b. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

The Water Quality Standards contain two distinct mixing zone requirements. The first requirement is general in nature and requires the "use of mixing zone concepts in evaluating permit limits for acute and chronic standards in 9VAC25-260-140.B". The second requirement is specific and establishes special restrictions for regulatory mixing zones "established by the Board".

The Department of Environmental Quality uses a simplified mixing model to estimate the amount of mixing of a discharge with the receiving stream within specified acute and chronic exposure periods. The simplified model contains the following assumptions and approximations:

- The effluent enters the stream from the bank, either via a pipe, channel or ditch.
- The effluent velocity isn't significantly greater (no more than 1 - 2 ft/sec greater) than the stream velocity.
- The receiving stream is much wider than its depth (width at least ten times the depth).
- Diffusive mixing in the longitudinal direction (lengthwise) is insignificant compared with advective transport (flow).
- Complete vertical mixing occurs instantaneously at the discharge point. This is assumed since the stream depth is much smaller than the stream width.
- Lateral mixing (across the width) is a linear function of distance downstream.
- The effluent is neutrally buoyant (e.g. the effluent discharge temperature and salinity are not significantly different from the stream's ambient temperature and salinity).
- Complete mix is determined as the point downstream where the variation in concentration is 20% or less across the width and depth of the stream.
- The velocity of passing and drifting organisms is assumed equal to the stream velocity.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. As such, **Attachment 10** and **Attachment 11** detail the mixing analyses for Outfall 005 and Outfall 006, respectively. **Attachment 7** and **Attachment 8** provide the subsequent wasteload allocation derivations.

c. Effluent Limitations, Outfall 005 and Outfall 006 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1). Ammonia as N:

This is an industrial stormwater discharge and ammonia based products are not utilized or stored at this facility. It is staff's best professional judgement that ammonia is not present in appreciable amounts; thus, not a pollutant of concern.

2). Total Residual Chlorine:

This is an industrial stormwater discharge and chlorine based products are not utilized or stored at this facility. Therefore, it is staff's best professional judgement that chlorine is not present in appreciable amounts; thus, not a pollutant of concern.

3). Metals/Organics:

Outfall 005

Both dissolved copper and silver monitoring and subsequent reasonable potential analysis indicated that these metals are not pollutants of concern and it is staff's best professional judgement that monitoring requirements cease with this reissuance. Dissolved zinc is still a concern in regards to acute effects; therefore, monitoring will be carried forward.

The permittee has been actively working with S.C.L. Railroad personnel regarding the pH and zinc issues originating from the rail yard adjacent to the facility. During the last permit term, the facility was required to monitor and submit progress reports regarding zinc mitigation. Progress reports submitted by the facility have indicated that the main source of zinc is the railroad classification yard based on observations and sampling data conducted by the facility's consultant.

It is staff's best professional judgement that the permittee continue working with railroad personnel and submit progress reports during this permit term. The progress reports and sampling results will be reevaluated during the next permit reissuance by DEQ staff to determine warranted actions. See Section 21.h. of this Fact Sheet for further details.

Outfall 006

Review of effluent data and subsequent analysis for dissolved zinc and nickel concluded that neither metal is present in appreciable amounts and do not pose to contravene water quality standards. Staff proposes that the monitoring requirements for both metals be removed with this reissuance.

See **Attachment 12** and **Attachment 13** for each respective outfall reasonable potential analysis.

d. Effluent Limitations and Monitoring, Outfall 005 and Outfall 006 – Conventional and Non-Conventional Pollutants

No changes to the total suspended solids (TSS) and pH limitations are proposed.

pH limitations are set at the water quality criteria.

Staff proposes that total phosphorus and total nitrogen monitoring be included with this reissuance during wet weather events. Monitoring data indicates that the average level at each outfall is less than 1 mg/L for total phosphorus; however continued monitoring is warranted due to the downstream impairments. Total nitrogen will provide relevant information concerning this facility in regards to any potential downstream impacts.

Total Organic Carbon (TOC):

The permittee requested that chemical oxygen demand (COD) monitoring be replaced with total organic carbon (TOC). The basis for this request was that TOC is the current technology in use, determination (informally) can be done onsite allowing for immediate response and less waste is generated as compared to COD analysis.

Total organic carbon is a measure of organic matter concentration in water. Sources may include decaying natural organic matter such as plant and animal detritus (humic acid, fulvic acid and amines) and urea. TOC may also be caused by man-made substances that come into contact with stormwater such as detergents, pesticides, fertilizers, herbicides, industrial chemicals and chlorinated organics.

Staff concurs with this request; however, there is no formal correlation between TOC levels and organics in order to ascertain what could be construed as normal or elevated sampling results. Therefore, staff is proposing a ′trigger value′ of 110 mg/L TOC be included with this reissuance. This reflects the benchmark concentration found in Industrial Sector K of the *General VPDES Permit for Discharges of Storm Water Associated with Industrial Activity*, 9VAC25-151 et seq. If monitoring results are greater than 110 mg/L, the permittee will be required to investigate and report, with the discharge monitoring report, the possible causes and corrective actions taken as warranted. Review of monitoring data submitted during the last permit term indicated that TOC levels were generally found well below this threshold; providing a baseline for the facility in which to gauge future monitoring results that may be suspect.

Dissolved Oxygen (DO):

During the last reissuance, dissolved oxygen limitations were placed on Outfall 005 and Outfall 006. The rationale for this limitation was the noted dissolved oxygen impairment. Staff believes that the dissolved oxygen limitation was applied in error. The noted impairment is the result of total suspended solids, total nitrogen and total phosphorus; pollutants which contribute to the dissolved oxygen impairments as noted in **Attachment 1**. These pollutants are accounted for under the Chesapeake Bay TMDL and as noted in Section 15.a of this Fact Sheet, this facility appears to be in compliance with the TMDL allocations and is not causing or contributing to the dissolved oxygen impairment. Review of effluent data indicated that the discharge does not contain elevated levels of oxygen demanding organics and the reported dissolved oxygen levels, even prior to the installation of the oxygenation units, were found above 5 mg/L consistently. In addition, the receiving stream has swamp-like characteristics as noted during staff's site visit. Swamp like waters contain inherently low instream dissolved oxygen levels. This impoundment is not caused by human activity; rather the result of wildlife activity downstream of the facility.

Staff proposes that the current limitation of 5.0 mg/L be removed and replaced with monitoring during this reissuance.

e. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in Section 19 of this Fact Sheet. Monitoring requirements were established for pH, total suspended solids, total organic carbon, total phosphorus, total nitrogen, hardness and zinc.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

18. Antibacksliding:

The backsliding proposed with this reissuance conforms to the anti-backsliding provisions of Section 402(o) of the Clean Water Act, 9VAC25-31-220.L. and 40 CFR 122.44.

The dissolved oxygen limitation imposed during the last reissuance was applied in error. Downstream impairments are noted for dissolved oxygen; however, this impairment may be the result of total suspended solids and nutrients present in the receiving stream. Effluent data indicates that total phosphorus from this facility is typically found below 1 mg/L and total suspended solids found at Outfall 005 and Outfall 006 averaged 16.5 mg/L and 27.7 mg/L, respectively. This facility is within the aggregated total suspended solids loadings referenced in the Chesapeake Bay TMDL.

19.a. Effluent Limitations/Monitoring Requirements for Outfall 005:

Estimated Total Flow of this Industrial Outfall is 0.132 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/M [c]	Measured
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/M [c]	Grab
Dissolved Oxygen (DO)	2	NA	NA	NL mg/L	NA	1/M [c]	Grab
Total Suspended Solids (TSS)	2	NA	NA	NA	NL mg/L	1/M [c]	24H-C
Total Organic Carbon (TOC) [a]	2	NA	NA	NA	NL mg/L	1/M [c]	24H-C
Total Hardness ($CaCO_3$)	2	NA	NA	NA	NL mg/L	1/M [c]	Grab
Zinc, Dissolved [b]	2	NA	NA	NA	NL µg/L	1/Q [c]	Grab
Total Phosphorus	2,4	NA	NA	NA	NL mg/L	1/6M [c]	24H-C
Total Nitrogen	2,4	NA	NA	NA	NL mg/L	1/6M [c]	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. Chesapeake Bay TMDL

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/M = Once every month.
1/Q = Once every calendar quarter.
1/6M = Once every six (6) months.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum of twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

[a] If monitoring results are > 110 mg/L, the permittee shall investigate possible causes and take corrective actions as warranted. A summary of the findings shall be included with the discharge monitoring reports.

[b] The permittee shall monitor for zinc at a frequency of once per calendar quarter. Semiannual reports comparing/summarizing the dry and wet weather monitoring results and the source reduction progress shall be due on the 10th of January and July of every year during this permit term. See Section 21.h.

[c] The permittee shall monitor for all parameters, including total nitrogen and total phosphorus, at a frequency of once every six months during a wet weather event. This will be in conjunction with, and shall satisfy, the respective monthly or quarterly monitoring frequency requirements as stated above. A wet weather event shall be a measureable storm event which results in a discharge consisting of both stormwater and non-stormwater sources.

The quarterly monitoring periods shall be January through March, April through June, July through September, and October through December.
The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

The semiannual monitoring periods shall be January through June and July through December.
The monitoring data shall be submitted on the DMR no later than the 10th day of the month following the monitoring period.

19.b. Effluent Limitations/Monitoring Requirements for Outfall 006:

Estimated Total Flow of this Industrial Outfall is 0.178 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/M [b]	Measured
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/M [b]	Grab
Dissolved Oxygen (DO)	2	NA	NA	NL mg/L	NA	1/M [b]	Grab
Total Suspended Solids (TSS)	2	NA	NA	NA	NL mg/L	1/M [b]	24H-C
Total Organic Carbon (TOC) [a]	2	NA	NA	NA	NL mg/L	1/M [b]	24H-C
Total Phosphorus	2,4	NA	NA	NA	NL mg/L	1/6M [b]	24H-C
Total Nitrogen	2,4	NA	NA	NA	NL mg/L	1/6M [b]	24H-C

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards
4. Chesapeake Bay TMDL

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/M = Once every month.
1/6M = Once every six (6) months.

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum of twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

[a] If monitoring results are > 110 mg/L, the permittee shall investigate possible causes and take corrective actions as warranted. A summary of the findings shall be included with the discharge monitoring reports.

[b] The permittee shall monitor for all parameters, including total nitrogen and total phosphorus, at a frequency of once every six months during a wet weather event. This will be in conjunction with, and shall satisfy, the respective monthly monitoring frequency requirements as stated above.
A wet weather event shall be a measureable storm event which results in a discharge consisting of both stormwater and non-stormwater sources.

The semiannual monitoring periods shall be January through June and July through December.
The monitoring data shall be submitted on the DMR no later than the 10th day of the month following the monitoring period.

19.c. Effluent Limitations/Monitoring Requirements for Outfall 013:

Flow to this Industrial Outfall is Stormwater from an Inert Debris Landfill.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.
Monitoring is only required if landfill operations resume; otherwise Section 19.d. governs this outfall.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Daily Maximum	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/Y	Estimate
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/Y	Grab
Chemical Oxygen Demand (COD)	2	NA	NA	NA	NL mg/L	1/Y	Grab
Biochemical Oxygen Demand (BOD_5)	2	NA	NA	NA	NL mg/L	1/Y	Grab
Total Suspended Solids (TSS)	2	NA	NA	NA	NL mg/L	1/Y	Grab
Total Organic Carbon (TOC)	2	NA	NA	NA	NL mg/L	1/Y	Grab
Total Kjeldahl Nitrogen (TKN)	2	NA	NA	NA	NL mg/L	1/Y	Grab
Oil & Grease	2	NA	NA	NA	NL mg/L	1/Y	Grab
Total Phosphorus	2	NA	NA	NA	NL mg/L	1/Y	Grab
Total Nitrogen	2	NA	NA	NA	NL mg/L	1/Y	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgement
3. Water Quality Standards

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.
1/Y = Once every calendar year.

Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.
Grab = An individual sample collected over a period of time not to exceed 15-minutes.

19.d. Effluent Limitations/Monitoring Requirements: Outfalls 001, 002, 010, 011, 012, 013, 018, 019, 020, 022, 025, 027

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

No monitoring or effluent limitations are proposed for these outfalls.

There shall be no process wastewater discharged from these outfalls.

These outfalls shall be governed by the Stormwater Management Plan. See Section 20.b.

20. Other Permit Requirements:

a. Permit Section Part I.B., contains quantification levels and compliance reporting instructions

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

b. Permit Section Part I.C. details the requirements of a Stormwater Management Plan

Industrial stormwater discharges may contain pollutants in quantities that could adversely affect water quality. Stormwater discharges which are discharged through a conveyance or outfall are considered point sources and require coverage by a VPDES permit. The primary method to reduce or eliminate pollutants in stormwater discharges from an industrial facility is through the use of best management practices (BMPs). Stormwater Management Plan requirements are derived from the VPDES General Permit for Storm Water Discharges Associated with Industrial Activity, 9VAC25-151 et seq.

21. Other Special Conditions:

a. O&M Manual Requirement. Required by VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the facility in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

b. Notification Levels. Required by VPDES Permit Regulation, 9VAC25-31-200.A for existing manufacturing, commercial, mining and silvicultural dischargers. The permittee shall report discharges of toxic pollutants not limited by this permit that exceed notification levels.

c. Materials Handling/Storage. 9VAC25-31-50.A prohibits the discharge of any wastes into State waters unless authorized by permit. Code of Virginia §62.1-44.16 and §62.1-44.17 authorize the Board to regulate the discharge of industrial waste or other waste.

d. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220.D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

e. Concept Engineering Report (CER). §62.1-44.16 of the Code of Virginia requires industrial facilities to obtain DEQ approval for proposed discharges of industrial wastewater. A CER sets forth preliminary concepts or basic information for the design of industrial wastewater treatment facilities and the supporting calculations for sizing the treatment operations. 9VAC25-40-70.A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade.

f. Facility Closure Plan. Code of Virginia § 62.1-44.16 and -44.19 of the State Water Control Law. This condition establishes the requirement to submit a closure plan for the wastewater treatment facility if the treatment facility is being replaced or is expected to close.

g. Inert Debris Landfill/Outfall 013. 9VAC25-31-210 allows development of conditions on a case-by-case basis to provide for and assure compliance with all applicable requirements of the law, the Clean Water Act and regulations. The permittee shall notify DEQ within 30 days of reopening the inactive inert landfill as the monitoring requirements found in Section 19.c. for Outfall 013 shall recommence.

h. Zinc Minimization. 9VAC25-31-210 allows development of conditions on a case-by-case basis to provide for and assure compliance with all applicable requirements of the law, the Clean Water Act and regulations. The permittee shall continue efforts to mitigate pH exceedances and elevated zinc levels from the rail yard classification area into the Hercules, Aqualon storm sewer system. Semiannual progress reports shall be submitted detailing the actions taken and summation of all required sampling results. The reports and sampling results will be reevaluated by DEQ staff during the next reissuance to determine further necessary actions.

The semiannual periods will be January 1st – June 30th and July 1st – December 31st of each year during this permit term; with reports due on July 10th and January 10th following the respective six (6) month period.

i. TMDL Reopener. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan or other wasteload allocation prepared under section 303 of the Act.

22. Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a. Special Conditions:

- Removed the Nutrient Enriched Waters special condition as this is no longer applicable and is addressed in the downstream TMDLs.
- The Best Management Practices was removed with this reissuance. The conditions and requirements are incorporated into the stormwater pollution prevention plan.
- The Compliance Reporting Under Part I.A. special conditions was removed since this is incorporated into Part I.B. of the permit.
- The Concept Engineering Report (CER) special condition was included with this reissuance in accordance with DEQ-PRO staff decision noted on 25 May 2010.
- The Facility Closure Plan was included with this reissuance based on the current VPDES Permit Manual, Section IN-3.A.22.
- The Zinc Minimization report requirements were modified to reflect the current status and the continuation to mitigate runon issues from the rail yard into the facility's storm sewer system.
- A reopener clause for Outfall 013 was included with this reissuance. The inert debris landfill is currently inactive. This special condition requires notification and recommencement of monitoring at Outfall 013 if the landfill is reopened.

b. Monitoring and Effluent Limitations:

- Removed the dissolved oxygen limitation of 5.0 mg/L at Outfall 005 and Outfall 006, as this limitation was not technically applied correctly and is not applicable to this type of discharge nor does effluent data indicate this facility is contributing to the downstream impairment.
- Removed COD, hardness, dissolved zinc and dissolved nickel monitoring requirements at Outfall 006. TOC will replace COD monitoring; reasonable potential analyses indicated that zinc and nickel did not pose water quality concerns; and hardness monitoring is not warranted since there is no metal monitoring.
- Removed COD, dissolved copper and dissolved silver monitoring requirements at Outfall 005. TOC will replace COD monitoring and reasonable potential analyses indicated that copper and silver did not pose water quality concerns.
- Total nitrogen and total phosphorus were added at Outfall 005 and Outfall 006 during wet weather events. These pollutants of concern were monitored at Outfall 905 and Outfall 906, which have been removed with this reissuance, and merged into the monitoring requirements for Outfalls 005 and 006.
- Propylene oxide was monitored at both Outfall 905 and Outfall 906 during the last permit term. All data indicated that the pollutant was not present; consequently monitoring for this parameter was not merged into Outfall 005 and Outfall 006. Monitoring requirements for this pollutant have been removed with this reissuance.

- Whole Effluent Toxicity testing was removed with this reissuance. Staff review of test results from 2010 to 2013 indicated that the effluent exhibits no toxicity to the test species *C. dubia*. See **Attachment 14** for a summary of the biomonitoring results. Agency guidance, GM 00-2012, suggests that WET testing may cease at facilities that (1) indicate a reasonable potential does not exist after evaluation and (2) that the facility does not meet screening criteria that would require regular toxicity testing.

c. Other:

- Removed stormwater Outfalls 905 and 906. Wet weather monitoring requirements will be merged and applied at Outfalls 005 and 006, respectively.

- Removed internal Outfall 601 as the monitoring data did not provide useful information and did not indicate any influence on downstream outfalls.

- Removed monitoring requirements at Outfall 013 as this outfall has not and does not indicate any discharge from this inert landfill area.

- The Section designation for the receiving stream was corrected with this reissuance. The previous Fact Sheet stated the receiving waters were in Section 2 of the James River; the correct Section should be 1.

- The River Mile was updated with this reissuance. The 2005 Fact Sheet noted the Rivermile as 2-BLY001.82. This was corrected to 2-BLY001.76 per **Attachment 1**.

24. Variances/Alternate Limits or Conditions: None.

25. Public Notice Information:

First Public Notice Date: TBD 2013 Second Public Notice Date: TBD 2013

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office; 13901 Crown Court; Woodbridge, VA 22193; Telephone No. 703-583-3873; Douglas.Frasier@deq.virginia.gov. See **Attachment 15** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s):	None.
Staff Comments:	The permit was not reissued prior to the expiration date due to Department processing delays. Annual permit fees were confirmed current on 10 July 2013. The DEQ-PRO Planning Staff has reviewed the draft permit and determined that the discharge is in conformance with the existing planning documents for the area. This discharge is not controversial.

The Hopewell City Mayor (Michael C Bujakowski:), City Manager (Mark Haley: mhaley@hopewellva.gov) and Executive Director of the Crater Planning District (Dennis Morris: dmorris@craterpdc.org) were notified of the public comment period on TBD in accordance with the Code of Virginia, §62.1-44.15:01.

26. Additional Comments:

State/Federal Agency Comments: See **Attachment 16** for the Department of Conservation and Recreation comments.

EPA has waived the right to comment on the adequacy of the draft permit.

Public Comments: No comments were received during the public comment period.

Owner Comments: TBD

Fact Sheet Attachments

Table of Contents

Hercules Incorporated Aqualon Division
VA0003492
2013 Reissuance

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Piedmont Regional Office
4949-A Cox Road Glen Allen, Virginia 23060

SUBJECT: Flow Frequency Determination / 303(d) Status
Hercules, Inc. Aqualon – VA0003492

TO: Jeremy Kazio

FROM: Jennifer Palmore, P.G.

DATE: January 2, 2013

COPIES: File

The Hercules, Inc. - Aqualon Division facility is located in Hopewell, VA. Flow frequencies have been requested at this site for use in developing effluent limitations for the VPDES permit.

Outfalls 005 and 006 are located on West Bear Creek and an unnamed tributary of West Bear. However the receiving streams originate on the Hercules property, therefore the Water Quality Standards have historically been applied at the confluence of West Bear Creek and Bailey Creek at rivermile 2-BLY001.76.

Bailey Creek is tidally influenced at the confluence; however, for modeling purposes the freshwater inflows at that location were determined. Flow measurements have been made on Bailey Creek from 1929 through 1998 at the Route 156 bridge in Hopewell, VA. The measurements were correlated with the same day daily mean values from the continuous record gage on Deep Creek near Mannboro (#02041000). The measurements and daily means were plotted on a logarithmic graph and a best-fit power trendline was drawn through the data points. The equation of the regression trend line was used to calculate the Bailey Creek flow frequencies. Flows were then extrapolated to the confluence using drainage area proportion.

The flow frequencies for the reference gage, the measurement site, and the discharge point are presented below. The regression analysis is attached.

Deep Creek near Mannboro, VA (#02041000):
Drainage area: 158 mi^2
High Flow Months: December to April
Period of Record: 1947-2003

1Q30 = 0.21 cfs	High Flow 1Q10 = 25 cfs
1Q10 = 0.80 cfs	High Flow 7Q10 = 29 cfs
7Q10 = 1.0 cfs	High Flow 30Q10 = 46 cfs
30Q10 = 2.8 cfs	HM = undetermined
30Q5 = 5.3 cfs	

Bailey Creek at Route 156, Hopewell, VA (#02042080):
Drainage Area = 13.8 mi^2

1Q30 = 0.80 cfs	High Flow 1Q10 = 4.8 cfs
1Q10 = 1.3 cfs	High Flow 7Q10 = 5.1 cfs
7Q10 = 1.4 cfs	High Flow 30Q10 = 6.1 cfs
30Q10 = 2.1 cfs	HM = undetermined
30Q5 = 2.7 cfs	

Bailey Creek at outfalls 005 and 006:

Drainage Area = 17.58 mi^2

1Q30 = 1.0 cfs (0.66 MGD)	High Flow 1Q10 = 6.2 cfs (4.0 MGD)
1Q10 = 1.7 cfs (1.1 MGD)	High Flow 7Q10 = 6.5 cfs (4.2 MGD)
7Q10 = 1.8 cfs (1.2 MGD)	High Flow 30Q10 = 7.7 cfs (5.0 MGD)
30Q10 = 2.7 cfs (1.7 MGD)	HM = undetermined
30Q5 = 3.4 cfs (2.2 MGD)	

This analysis does not address any withdrawals, discharges, or springs influencing the flow in Bailey Creek upstream of the discharge point.

During the 2010 and draft 305(b)/303(d) Integrated Water Quality Assessments, tidal Bailey Creek was assessed as a Category 5D water ("The Water Quality Standard is not attained where TMDLs for a pollutant(s) have been developed but one or more pollutants are still causing impairment requiring additional TMDL development.") The applicable fact sheets are attached. The Aquatic Life Use is impaired due to inadequate submerged aquatic vegetation (SAV) and dissolved oxygen in the lower James River tidal freshwater estuary as well as pH exceedances in Bailey Creek. In addition, ammonia exceedances, excessive algal growth, and sediment exceedances for mercury, PCBs, and chlordane are considered non-impairing observed effects. The Recreation Use is impaired due to E. coli violations. The Fish Consumption Use is impaired due to PCBs in fish tissue; arsenic and kepone are observed effects. The Wildlife Use is considered fully supporting with observed effects due to ammonia exceedances.

Bailey Creek is located within the study area for the James River – Hopewell to Westover Bacterial TMDL, which was approved by the EPA on 7/10/2008 and by the SWCB on 4/28/2009. Hercules was modeled in the TMDL; however, the facility is not permitted for fecal coliform control and was not assigned a wasteload allocation.

Hercules was also addressed in the Chesapeake Bay TMDL, which was approved by the EPA on 12/29/2010. The TMDL allocates loads for total nitrogen, total phosphorus, and total suspended solids (TSS) to protect the dissolved oxygen and submerged aquatic vegetation acreage criteria in the Chesapeake Bay and its tidal tributaries. The discharge was included in the aggregated loads for non-significant wastewater dischargers in the lower tidal freshwater James River estuary (JMSTF1). The nutrient allocations are administered through the Watershed Nutrient General Permit; the TSS allocations are considered aggregated and facilities with technology-based TSS limits are considered to be in conformance with the TMDL.

Bailey Creek has historically been considered a Tier 1 water.

The stream is designated as tidal freshwater in the Virginia Water Quality Standards; therefore the freshwater criteria should be applied. The discharge is located within the Migratory and Spawning Nursery segment.

Water quality data from monitoring station 2-BLY000.65 is attached. The station is located on Bailey Creek at the Route 10 bridge and is approximately 1.11 miles downstream of the confluence with West Bear Creek.

If you have any questions concerning this analysis or need additional information, please let me know.

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080206

STREAM NAME: Bailey Creek (tidal), Cattail Creek (tidal)

TMDL ID: G03E-01-BAC **2012 IMPAIRED AREA ID:** CB-JMSTFL

ASSESSMENT CATEGORY: 4A **TMDL DUE DATE:** 2010

IMPAIRED SIZE: 0.1226 - Sq. Mi. **Watershed:** VAP-G03E

INITIAL LISTING: 1994

UPSTREAM LIMIT: Fall line

DOWNSTREAM LIMIT: James River confluence

Segment begins at Bailey Creek fall line and extends downstream to its mouth at the confluence with the James River. The segment includes the tidal portion of Cattail Creek.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Recreation Use - Not Supporting

IMPAIRMENT: E. coli

The segment was initially listed as impaired of the Recreation Use on the 1994 cycle 303(d) list because of excessive exceedances of the fecal coliform standards.

For the 2012 303(d) list, the segment continues to be assessed as not supporting of the Recreation Use goal based on an E. coli exceedance rate of 8/48 at 2-BLY00.65.

The TMDL was completed and was approved by the EPA on 7/10/2008 and by the SWCB on 4/28/2009. The segment is considered Category 4A.

IMPAIRMENT SOURCE: NPS - Urban, Straight Pipes/Sewer Overflows

The TMDL call for reductions in NPS - Urban/Residential and Straight Pipes/Sewer Overflows.

RECOMMENDATION: Implementation

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080206

STREAM NAME: James River and Various Tributaries

TMDL ID: G01E-03-PCB **2012 IMPAIRED AREA ID:** CB-JMSTFU

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2014

IMPAIRED SIZE: ~325 - Stream mile **Watershed:** VAP-G01E

INITIAL LISTING: 2002

UPSTREAM LIMIT: Fall line

DOWNSTREAM LIMIT: Hampton Roads Bridge Tunnel

Estuarine James River from the fall line to the Hampton Roads Bridge Tunnel, including several tributaries listed below.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Fish Consumption Use - Not Supporting

IMPAIRMENT: Fish Tissue - PCBs, VDH Fish Consumption Restriction

During the 2002 cycle, the James River from the Fall line to Queens Creek was considered not supporting of the Fish Consumption Use due to PCBs in multiple fish species at multiple DEQ monitoring locations.

During the 2004 cycle, a VDH Fish Consumption Restriction was issued from the fall line to Flowerdew Hundred and the segment was adjusted slightly to match the Restriction. In addition, in the 2004 cycle, the Chickahominy River from Walkers Dam to Diascund Creek was assessed as not supporting the Fish Consumption Use because the DEQ screening value for PCBs was exceeded in 3 species during sampling in 2001.

During the 2006 cycle, the VDH restriction was extended on 12/13/2004 to extend from the I-95 bridge downstream to the Hampton Roads Bridge Tunnel and include the tidal portions of the following tributaries:

Appomattox River up to Lake Chesdin Dam
Bailey Creek up to Route 630
Bailey Bay
Chickahominy River up to Walkers Dam
Skiffes Creek up to Skiffes Creek Dam
Pagan River and its tributary Jones Creek
Chuckatuck Creek
Nansemond River and its tributaries Bennett Creek and Star Creek
Hampton River
Willoughby Bay and the Elizabeth R. system (Western, Eastern, and Southern Branches and Lafayette R.) and tributaries St. Julian Creek, Deep Creek, and Broad Creek

The advisory was modified again on 10/10/2006 to add Poythress Run.

The impairments were combined. The TMDL for the lower extended portion is due in 2018.

IMPAIRMENT SOURCE: Unknown

The source of the PCBs is considered unknown.

RECOMMENDATION: Toxic Source Assessment

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080206

STREAM NAME: James River Tidal Freshwater (Lower) Estuary

TMDL ID: JMSTFL-SAV-BAY **2012 IMPAIRED AREA ID:** CB-JMSTFL

ASSESSMENT CATEGORY: 4A **TMDL DUE DATE:** 2010

IMPAIRED SIZE: - Sq. Mi. **Watershed:** VAP-G03E

INITIAL LISTING: 1998

UPSTREAM LIMIT: Appomattox River

DOWNSTREAM LIMIT: Tidal Freshwater/Oligohaline boundary

The James River Lower Tidal Freshwater Estuary.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting, Shallow Water Subuse - Not Supporting

IMPAIRMENT: Aquatic Macrophytes

The James River from the Appomattox River to the Chickahominy River was originally listed on the 1998 list as fully supporting but threatened of the Aquatic Life Use goal based on chlorophyll_a exceedances. During the 1998 cycle, EPA extended the segment upstream to the fall line and downgraded the river to not supporting the Aquatic Life Use, citing nutrient concerns.

In previous cycles, the mainstem James River had acceptable dissolved oxygen levels. In addition the entire tidal freshwater portion (fall line to just above the Chickahominy River) has good benthic community based on the results from the Chesapeake Bay Benthic Index of Biological Community; therefore the James River from the fall line to the oligohaline boundary was considered impaired solely for Nutrients/Eutrophication Biological Indicators (EPA Overlist).

During the 2006 cycle, the Chesapeake Bay water quality standards were implemented. The Lower Tidal Freshwater James River from the Appomattox to the Oligohaline boundary fails the Shallow Water Use SAV and water clarity acreage criteria.

The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010, therefore the segment is Category 4A. However the Federal TMDL ID was not available at the time of the assessment.

IMPAIRMENT SOURCE: Nonpoint Source, Point Source

The Chesapeake Bay TMDL allocates total nitrogen, total phosphorus, and total suspended solids to point- and nonpoint sources throughout the Bay watershed.

RECOMMENDATION: Implementation

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080206

STREAM NAME: James River Tidal Freshwater (Lower) Estuary

TMDL ID: JMSTFL-DO-BAY **2012 IMPAIRED AREA ID:** CB-JMSTFL

ASSESSMENT CATEGORY: 4A **TMDL DUE DATE:** 2010

IMPAIRED SIZE: - Sq. Mi. **Watershed:** VAP-G03E

INITIAL LISTING: 1998

UPSTREAM LIMIT: Appomattox River

DOWNSTREAM LIMIT: Tidal Freshwater/Oligohaline boundary

The James River Lower Tidal Freshwater Estuary.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Aquatic Life Use - Not Supporting, Open Water Subuse - Not Supporting

IMPAIRMENT: Dissolved Oxygen

The mainstem James River from the Appomattox River to the Chickahominy River was originally listed on the 1998 list as fully supporting but threatened of the Aquatic Life Use goal based on chlorophyll_a exceedances. During the 1998 cycle, EPA extended the segment upstream to the fall line and downgraded the river to not supporting the Aquatic Life Use, citing nutrient concerns.

In previous cycles, the mainstem James River had acceptable dissolved oxygen levels. In addition the entire tidal freshwater portion (fall line to just above the Chickahominy River) has good benthic community based on the results from the Chesapeake Bay Benthic Index of Biological Community; therefore the James River from the fall line to the oligohaline boundary was considered impaired solely for Nutrients/Eutrophication Biological Indicators (EPA Overlist).

Several tributaries within the James River system, including tidal Bailey Bay, had previously been listed for dissolved oxygen.

During the 2006 cycle, the Chesapeake Bay water quality standards were implemented. The Lower Tidal Freshwater James River segment fails the 30-day Open Water summer dissolved oxygen criteria. The 30-day rest-of-year standard is attained. There is insufficient information to assess the other OW criteria or the Migratory Spawning Use.

The Chesapeake Bay TMDL was approved by the EPA on 12/29/2010, therefore it is considered Category 4A. However, the Federal TMDL ID was not available at the time of the assessment.

IMPAIRMENT SOURCE: Nonpoint Source, Point Source

The Chesapeake Bay TMDL allocates total nitrogen, total phosphorus, and total suspended solids to point- and nonpoint sources throughout the Bay watershed.

RECOMMENDATION: Implementation

2012 Fact Sheets for 303(d) Waters

RIVER BASIN: James River Basin **HYDROLOGIC UNIT:** 02080206

STREAM NAME: **Bailey Creek (tidal), Cattail Creek (tidal)**

TMDL ID: **G03E-01-PCB** **2012 IMPAIRED AREA ID:** CB-JMSTFL

ASSESSMENT CATEGORY: 5A **TMDL DUE DATE:** 2024

IMPAIRED SIZE: 0.1226 - Sq. Mi. **Watershed:** VAP-G03E

INITIAL LISTING: 2012

UPSTREAM LIMIT: Fall line

DOWNSTREAM LIMIT: James River confluence

Segment begins at Bailey Creek fall line and extends downstream to its mouth at the confluence with the James River. The segment includes the tidal portion of Cattail Creek.

CLEAN WATER ACT GOAL AND USE SUPPORT:

Fish Consumption Use - Not Supporting

IMPAIRMENT: PCB

During the 2012 cycle, tidal Bailey Creek was impaired of the Fish Consumption Use due to two exceedances of the Human Health - Other Surface Waters WQS for water column PCBs. The samples were collected at 2-BLY000.65 as part of a 2009 source identification study for the VDH PCB advisory in the James River.

IMPAIRMENT SOURCE: Unknown

The source of the PCBs is unknown.

RECOMMENDATION: Problem Characterization

NPDES PERMIT RATING WORK SHEET

[X] Regular Addition
[ ] Discretionary Addition
[ ] Score change, but no status Change
[ ] Deletion

VPDES NO. : VA0003492

Facility Name: Hercules Incorporated – Aqualon Division
City / County: City of Hopewell
Receiving Water: Bailey Creek
Waterbody ID: VAP-G03E

Is this facility a steam electric power plant (sic =4911) with one or more of the following characteristics?

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power Plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rater

[ ] Yes; score is 600 (stop here) [X] NO; (continue)

Is this permit for a municipal separate storm sewer serving a population greater than 100,000?

[ ] YES; score is 700 (stop here)
[X] NO; (continue)

FACTOR 1: Toxic Pollutant Potential

PCS SIC Code: _____ Primary Sic Code: 2869 Other Sic Codes: _____ _____ _____

Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the Toxicity potential from Appendix A. Be sure to use the TOTAL toxicity potential column and check one)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
[ ] No process waste streams	0	0	[ ] 3.	3	15	[ ] 7.	7	35
[ ] 1.	1	5	[ ] 4.	4	20	[ ] 8.	8	40
[ ] 2.	2	10	[ ] 5.	5	25	[X] 9.	9	45
			[ ] 6.	6	30	[ ] 10.	10	50

Code Number Checked: 9

Total Points Factor 1: 45

FACTOR 2: Flow/Stream Flow Volume (Complete either Section A or Section B; check only one)

Section A – Wastewater Flow Only considered

Wastewater Type (see Instructions)			Code	Points
Type I:	Flow < 5 MGD	[X]	11	0
	Flow 5 to 10 MGD	[ ]	12	10
	Flow > 10 to 50 MGD	[ ]	13	20
	Flow > 50 MGD	[ ]	14	30
Type II:	Flow < 1 MGD	[ ]	21	10
	Flow 1 to 5 MGD	[ ]	22	20
	Flow > 5 to 10 MGD	[ ]	23	30
	Flow > 10 MGD	[ ]	24	50
Type III:	Flow < 1 MGD	[ ]	31	0
	Flow 1 to 5 MGD	[ ]	32	10
	Flow > 5 to 10 MGD	[ ]	33	20
	Flow > 10 MGD	[ ]	34	30

Section B – Wastewater and Stream Flow Considered

Wastewater Type (see Instructions)	Percent of Instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10 %	[ ]	41	0
	10 % to < 50 %	[ ]	42	10
	> 50%	[ ]	43	20
Type II:	< 10 %	[ ]	51	0
	10 % to < 50 %	[ ]	52	20
	> 50 %	[ ]	53	30

Code Checked from Section A or B: 11

Total Points Factor 2: 0

NPDES PERMIT RATING WORK SHEET

FACTOR 3: Conventional Pollutants

(only when limited by the permit)

A. Oxygen Demanding Pollutants: (check one) ☐ BOD ☐ COD ☐ Other: _____

Permit Limits: (check one)	Code	Points
[X] < 100 lbs/day	1	0
[ ] 100 to 1000 lbs/day	2	5
[ ] > 1000 to 3000 lbs/day	3	15
[ ] > 3000 lbs/day	4	20

Code Number Checked: 1

Points Scored: 0

B. Total Suspended Solids (TSS)

Permit Limits: (check one)	Code	Points
[X] < 100 lbs/day	1	0
[ ] 100 to 1000 lbs/day	2	5
[ ] > 1000 to 5000 lbs/day	3	15
[ ] > 5000 lbs/day	4	20

Code Number Checked: 1

Points Scored: 0

C. Nitrogen Pollutants: (check one) ☐ Ammonia ☐ Other: _____

Permit Limits: (check one)	*Nitrogen Equivalent*	Code	Points
[ ]	< 300 lbs/day	1	0
[ ]	300 to 1000 lbs/day	2	5
[ ]	> 1000 to 3000 lbs/day	3	15
[ ]	> 3000 lbs/day	4	20

Code Number Checked: NA

Points Scored: 0

Total Points Factor 3: 0

FACTOR 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this include any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above reference supply.

☐ YES; (If yes, check toxicity potential number below)

[X] NO; (If no, go to Factor 5)

Determine the *Human Health* potential from Appendix A. Use the same SIC doe and subcategory reference as in Factor 1. (Be sure to use the *Human Health* toxicity group column – check one below)

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
☐ No process waste streams	0	0	☐ 3.	3	0	☐ 7.	7	15
☐ 1.	1	0	☐ 4.	4	0	[X] 8.	8	20
☐ 2.	2	0	☐ 5.	5	5	☐ 9.	9	25
			☐ 6.	6	10	☐ 10.	10	30

Code Number Checked: 8

Total Points Factor 4: 20

NPDES PERMIT RATING WORK SHEET

FACTOR 5: Water Quality Factors

A. *Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technology-base federal effluent guidelines, or technology-base state effluent guidelines), or has a wasteload allocation been assigned to the discharge?*

		Code	Points
[ ]	YES	1	10
[X]	NO	2	0

B. *Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?*

		Code	Points
[ ]	YES	1	0
[X]	NO	2	5

C. *Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?*

		Code	Points
[ ]	YES	1	10
[X]	NO	2	0

Code Number Checked: A 2 B 2 C 2

Points Factor 5: A 0 + B 5 + C 0 = **5**

FACTOR 6: Proximity to Near Coastal Waters

A. Base Score: Enter flow code here (from factor 2) 11

Check appropriate facility HPRI code (from PCS):

	HPRI#	Code	HPRI Score
[ ]	1	1	20
[X]	2	2	0
[ ]	3	3	30
[ ]	4	4	0
[ ]	5	5	20

HPRI code checked : 2

Enter the multiplication factor that corresponds to the flow code: 0.00

Flow Code	Multiplication Factor
11, 31, or 41	0.00
12, 32, or 42	0.05
13, 33, or 43	0.10
14 or 34	0.15
21 or 51	0.10
22 or 52	0.30
23 or 53	0.60
24	1.00

Base Score (HPRI Score): 0 X (Multiplication Factor) 0.00 = 0

B. Additional Points – NEP Program

For a facility that has an HPRI code of 3, does the facility discharge to one of the estuaries enrolled in the National Estuary Protection (NEP) program (see instructions) or the Chesapeake Bay?

	Code	Points	
[ ]	1	10	NA
[ ]	2	0	

C. Additional Points – Great Lakes Area of Concern

For a facility that has an HPRI code of 5, does the facility discharge any of the pollutants of concern into one of the Great Lakes' 31 area's of concern (see instructions)?

	Code	Points	
[ ]	1	10	NA
[ ]	2	0	

Code Number Checked: A 0 B NA C NA

Points Factor 6: A 0 + B 0 + C 0 = **0**

VA0003492

NPDES PERMIT RATING WORK SHEET

SCORE SUMMARY

Factor	Description	Total Points
1	Toxic Pollutant Potential	45
2	Flows / Streamflow Volume	0
3	Conventional Pollutants	0
4	Public Health Impacts	20
5	Water Quality Factors	5
6	Proximity to Near Coastal Waters	0
	TOTAL (Factors 1 through 6)	70

S1. Is the total score equal to or greater than 80 ☐ YES; (Facility is a Major) ☒ NO

S2. If the answer to the above questions is no, would you like this facility to be discretionary major?

☒ NO

☐ YES; (Add 500 points to the above score and provide reason below:

Reason: _____

NEW SCORE : 70

OLD SCORE : 75.5

Permit Reviewer's Name : Douglas Frasier

Phone Number: 703-583-3873

Date: 12 July 2013

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Aqualon Company, a Division of Hercules Incorporated and a Delaware Partnership
Facility Address: 1111 Hercules Road, Hopewell, VA 23860
Facility EPA ID #: VAD003121928

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   __X__ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ If data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__X__ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

The October 2001 Facility Lead Corrective Action Agreement Workplan identified 34 Solid Waste Management Units (SWMUs) at the Hercules – Aqualon facility (Facility). After a review of the operational histories and current status of the units, ten (10) SWMUs were identified as needing further investigative activities. The remaining 24 SWMUs were designated as No Further Action (NFA) units; specific unit descriptions and supporting evidence for the NFA designations can be found in the October 2001 Workplan previously submitted to and approved by USEPA. Characterization efforts for the Facility's Environmental Indicators have therefore been focused on these ten units. Hercules – Aqualon proposed and implemented two phases of field activities for the investigation of nine (9) of the ten (10) units. The 10th SWMU, the Natrosol Lagoon, was well characterized through a series of investigations performed subsequent to its closure in 1995.

The Phase I Investigation was conducted in December 2001, and included the collection of environmental samples at five SWMUs, including the collection of groundwater samples from the monitoring wells surrounding SWMU #8 / #29, the Reten/Aqualon Basin/Anoxic Basin (RAB). A summary of the sampling results from Phase I was provided to USEPA in the February 2002 SWMU Summary Information Report – Phase I Investigation.

The Phase II Investigation was conducted in November 2002, and included the installation and sampling of nine new groundwater monitoring wells associated with the two Whitewater Lagoons (WWL), SWMUs #3 & #4, and the Landfills (LF), SWMU #5. A summary of the sampling results from Phase II was provided to USEPA in the April 2003 SWMU Summary Information Report – Phase II Investigation.

All monitoring wells sampled during the two phases of investigation (RAB-series, WWL-series, and LF-series) are screened entirely in the uppermost aquifer at the site property.

Groundwater sampling data from the two phases of work were initially screened against primary drinking water Maximum Contaminant Levels (MCLs) and April 2003 USEPA Region III Risk-based Concentrations (RBCs) for

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

Tap Water (using a hazard coefficient of 0.1 for noncarcinogens). The following constituents were detected above the Region III Tap Water RBC screening criteria in site monitoring wells:

Volatile Organic Compounds (VOCs):

- Methylene chloride,
- Chloroform,
- 1,2-dichloroethane,
- 1,4-dioxane,
- Ethyl ether, and
- Trichloroethylene.

Alcohols

- 2-butoxyethanol,
- Tert-butyl alcohol, and
- Ethanol.

Semivolatile Organic Compounds (SVOCs):

- Bis (2-ethylhexyl) phthalate, and
- Bis (2-chloroethyl) ether.

Inorganics:

- Aluminum,
- Arsenic,
- Barium,
- Chromium,
- Cobalt,
- Iron,
- Manganese,
- Thallium, and
- Vanadium.

However, the detections of 1,2-dichloroethane, trichloroethylene, arsenic, barium, and chromium do not exceed their respective MCLs, and have not been retained for further evaluation under this EI. Only the detections of thallium in monitoring wells WWL-2 and WWL-3U are above the MCL.

Several detected compounds that do not have published MCLs or RBCs have also been included above for consideration: tert-butyl alcohol and ethanol. Detection tables showing all of the screening exceedances are attached as ***Tables 1, 2, and 3.*** ***Figure 1*** also shows the locations of the various monitoring wells sampled during the two phases of field investigations.

In addition, the historical investigations of the Natrosol Lagoon (NAT) included the monitoring of groundwater impacts through the installation and sampling of four monitoring wells (NAT-1 to NAT-4) surrounding the unit. Quarterly groundwater monitoring events of these monitoring wells have indicated detections of tert-butyl alcohol as high as 105,000 mg/L. The four NAT monitoring wells are also screened entirely in the uppermost aquifer.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

__X__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Descriptions of the regional geology in the literature indicate the presence of coarser terrace deposits underlain by fine-grained marine sediments of the Yorktown formation. Observations during the various subsurface investigations at the site confirm the presence of an upper silty sand aquifer, varying in thickness from approximately 10 to 30 feet. This upper aquifer is underlain by a low-permeability blue-gray marine clay layer (varying in thickness from approximately 10 to 18 feet) which appears to be laterally continuous across the site; the presence of the marine clay was verified in the vast majority of the monitoring wells installed at the site. In a few of the monitoring wells (LF-2 and LF-4) located in close proximity to the deeply incised onsite creeks), both the upper silty sand aquifer and underlying marine clay appear to have been eroded away. Deep monitoring wells installed in the central portion of the site (MW-5D and MW-8D) have also identified a lower aquifer beneath the marine clay unit; however, vertical migration of contamination appears to be limited by the low permeability and pervasiveness of the marine clay layer, and the presence of an upward vertical gradient between the two aquifers.

Observations from the installation of the WWL-series monitoring wells (downgradient of the two Whitewater Lagoons, SWMUs #3 and #4) and LF-series monitoring wells (downgradient of the landfill, SWMU #5) indicate that as you approach Bailey and Cattail Creeks along the southern property boundary of the site, 1) the upper silty sand aquifer appears to "pinch out" completely, and 2) the marine clay layer is found at shallower depths (<20 feet). Correspondingly, groundwater in the upper aquifer appears to flow along the underlying low-permeability marine clay, and discharge directly into the adjacent creeks. Comparisons between groundwater levels in the LF-series of monitoring wells (which are screened in the upper aquifer) and surface water levels in the creeks (as measured at fixed surface water monitoring points) also confirm a direct hydraulic connection. Liquid level data from the November 2002 groundwater sampling event are shown graphically on the groundwater contour map in ***Figure 2*** and the cross-sections on ***Figure 3***. Cross-section B-B' in ***Figure 3*** also shows the relationship between the upper aquifer and the underlying marine clay from MW-10 in the central portion of the site to LF-3 immediately adjacent to the creeks.

Additional information regarding the regional and site-specific geology was previously submitted to USEPA in the June 2002 *Hydrogeologic Evaluation*, the February 2002 *SWMU Summary Information Report – Phase I Investigation*, and the April 2003 *SWMU Summary Information Report – Phase II Investigation*. These reports and various historical investigations performed at the facility conclude that Cattail / Bailey Creeks are the ultimate discharge points for groundwater from both the upper and lower aquifers beneath the facility. Based on this information, the "existing area of contaminated groundwater" is located entirely on the Facility site within the upper silty sand aquifer, or discharges into the onsite streams. The potential for vertical migration is limited by the pervasive marine clay layer, and the potential for lateral migration is limited by the hydraulic barrier of Bailey and Cattail Creeks.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

__X__ If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Figure 2 shows site-wide groundwater contours and flow-paths for the upper aquifer, and water level elevations for the lower aquifer (where available), based on liquid levels collected during the November 2002 groundwater sampling event. As shown, groundwater beneath the Facility discharges into:

1) the onsite receiving steams of West Bear Creek and East Bear Creek,
2) the unnamed receiving stream on the western portion of the site property, or
3) directly into Cattail / Bailey Creek running along the southern property boundary.

West Bear Creek, East Bear Creek, and the unnamed stream themselves also eventually discharge into Cattail / Bailey Creek, making it the ultimate surface water discharge point for the site property. Based on the analytical detections identified in the LF-series of monitoring wells, "contaminated" groundwater could discharge into Cattail / Bailey Creek.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

__X__ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

The groundwater monitoring analytical results summarized in ***Tables 1, 2, and 3*** identify several compounds with maximum detected concentrations greater than 10 times the project screening criteria (MCL, or Tap Water RBC if no MCL exists), including bis(2-chloroethyl) ether, 2-butoxyethanol, 1,4-dioxane, ethyl ether, iron, and manganese. However, the majority of these 10X exceedances were identified in monitoring wells located at significant distances from discharge into off-site surface water, and not in groundwater prior to entry to the hyporheic zone directly adjacent to the receiving surface water body. Of the compounds exceeding 10 times the screening level, only iron and manganese are present in site monitoring wells at concentrations greater than 100 times the project screening criteria.

- Groundwater monitored by the NAT and RAB monitoring wells discharges to the onsite receiving stream of East Bear Creek, which then flows onsite more than 1,500 feet before discharging to Bailey Creek at the edge of the site property.
- Groundwater monitored by the WWL monitoring wells flows 600 to 900 feet (depending on the individual monitoring well location) to the southeast before discharging to Cattail / Bailey Creek.

The groundwater concentrations at the hyporheic zone are expected to be significantly lower due to the effects of dilution from the advection / dispersion / diffusion transport processes. For example, groundwater / surface water sampling performed in 1999-2000 for the Natrosol Lagoon, and documented in the October 2000 *Annual Monitoring Report – Natrosol Lagoon (September 1999 through June 2000)* shows significant reductions in concentrations for a variety of compounds over the 200-foot distance between the NAT monitoring wells and surface water monitoring

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

points NAT-SWMP-1 and NAT-SWMP-2 for the discharge into East Bear Creek; see ***Figure 1.*** Exhibit 1 below summarizes the tert-butyl alcohol (TBA) reductions in concentrations from the 2nd Quarter 2000 sampling:

Exhibit 1

		NAT-1	NAT-2	NAT-3	NAT-4	NAT-SWMP-1	NAT -SWMP-2
Approximate distance from southern edge of Natrosol Lagoon						150 feet	200 feet
Tert-butyl alcohol	*mg/L*	0.316	56	107	14.5	1.2	0.052

The concentrations of other organic and inorganic constituents from the 2nd Quarter 2000 sampling show similar reductions (one to two orders of magnitude) between groundwater and surface water, as documented in the full report which was previously submitted to USEPA as an attachment to the Current Human Exposures Under Control Environmental Indicator. Correspondingly, the detections identified in the RAB monitoring wells and WWL monitoring wells are expected to undergo similar reductions in concentration as groundwater flows to the hyporheic zone. Therefore, with the exception of manganese, none of the organic or inorganic compounds exceeding 10 times the screening level in groundwater are expected to reach the surface water bodies at concentrations exceeding 10 times the screening levels.

Based on the foregoing evaluation, only the detection of manganese of 10,900 ug/L in monitoring well LF-3 (downgradient of SWMU #5) may exceed 100 times the project screening criteria in the hyporheic zone. Using the average concentration of manganese of 4,433 ug/L from monitoring wells LF-1, LF-2, and LF-3, and the estimated flow of 0.15 cfs (documented in the attached Dilution Factor Calculation Worksheet), the estimated total mass loading being discharged into Cattail / Bailey Creek is 59.4 kg/yr. This estimated loading is conservatively based on the assumption that the average manganese concentration is present along the full length and depth of the groundwater discharge from SWMU #5.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

__X__ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR

2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

As described above, the proximity of SWMU #5 to Cattail / Bailey Creek may potentially allow the discharge of contaminants from groundwater to surface water. Initial evaluation of the potential impacts to surface water was performed by comparing the detections in groundwater to 10x the National Recommended Water Quality Criteria (November 2002) for Organisms and Water + Organisms. ***Tables 1, 2, and 3*** show the calculated criteria and resulting screening. Of the constituents exceeding the project groundwater criteria, only one SVOC, bis(2-chloroethyl) ether, and two (2) inorganics, iron and manganese, exceed at least one of the modified Water Quality

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

criteria. However, as described above, only the concentrations present in the LF-series of monitoring wells are expected to discharge to surface water due to their proximity to the nearest surface water body (25 to 200 feet). Since bis(2-chloroethyl) ether was only detected in monitoring well WWL-3L (900 feet from surface water), only the two inorganics of iron and manganese will undergo continued evaluation.

The actual dilution capacities of Cattail and Bailey Creeks are believed to be significantly greater than provided by the generic 10x dilution criteria. Although direct stream gauging data is not available, the Virginia Water Control Board Office of Water Quality Assessments calculated 7Q10 flows of 0.330 cfs for Cattail Creek and 1.860 cfs for Bailey Creek based on comparisons with other streams of similar type, size, and drainage area. Based on the available data regarding site hydrogeology (hydraulic gradients and hydraulic conductivities) and the waste materials identified in SWMU #5, an estimate of the actual dilution capacities of the two creeks can be calculated. The dilution factor calculation worksheet, including documentation of assumptions and information sources, is attached. Use of the 7Q10 flows for calculation of dilution also neglects the effects of the tidal influences on Bailey and Cattail Creeks. Previous estimates of the range of tides in Bailey Creek have been as high as 2.6 feet. Since the tides operate independently of the low flow of the stream (which is dependent on precipitation, surface water flows, and groundwater recharge), the actual dilution capacities are even greater than that calculated. Neglecting these potential tidal effects, the calculated dilution from groundwater into Bailey Creek is 127X. Exhibit 2 summarizes the anticipated concentrations of the two subject compounds that were detected (iron, and manganese) in the LF-series of monitoring wells, based on the 127X dilution.

Exhibit 2

Compound		**Water Quality Criteria – Water + Organism**	**Water Quality Criteria - Organism**	**Anticipated Maximum Surface Water Concentration**
Iron	*ug/L*	300	N/A	60.9
Manganese	*ug/L*	50	100	85.2

Further assessment of potential impacts to ecological receptors was explored through the preparation of the attached *Proposed Aquatic Life Benchmarks for Chemicals Detected at the Hercules-Aqualon Hopewell, Virginia Site* report (Report). It uses a step-by-step process to derive appropriate aquatic life benchmarks for the constituents of concern based on 1) existing criteria from federal or state regulatory agencies, 2) existing criteria from published studies, or 3) calculated criteria based on Quantitative Structure Activity Relationships (QSARs). Additional information regarding the derivation of the criteria is included in the attached Report. Table 1 of the Report summarizes the criteria from the various sources, and provides an initial comparison against the maximum detected concentrations for the subject constituents. As shown in Table 1 of the Report, all of the evaluated maximum organic detections are well below the relevant aquatic life benchmarks.

Exhibit 3 below further evaluates the aquatic life benchmarks for the inorganic compounds iron and manganese against the anticipated concentrations based on the calculated 127X dilution. As shown, none of the anticipated surface water concentrations exceed the calculated aquatic life criteria.

Exhibit 3

Compound		**Aquatic Life Benchmark**	**Anticipated Maximum Surface Water Concentration**
Iron	*ug/L*	1,000	60.9
Manganese	*ug/L*	120	85.2

Based on these evaluations to human and ecological receptors, the potential discharge of "contaminated" groundwater from the Facility is believed to be acceptable, and to not negatively impact human health or the environment. Based on the above-described evaluations and assumptions, the surface water concentrations of manganese may exceed water quality criteria (water + organism). However, the anticipated concentrations of manganese are believed to be currently acceptable based on the magnitude of the exceedance, and the low risk / lack of potential exposure. The two water quality criteria, (water + organism, and organism only), are based on exposure through ingestion of contaminated groundwater / surface water, and ingestion of contaminated organisms (e.g. fish). There are no known users of groundwater or surface water as drinking water in the immediate vicinity of the site, and no public surface water intakes downstream of the site. The receiving surface water body (Cattail / Bailey

Creek) is also not a readily fishable water body due to its small size, the presence of the beaver dams both upstream and downstream of the site property, and its location among the various industrial facilities in eastern Hopewell. Based on these factors, the overall potential for exposures and the intensity of such exposures are quite low; further information regarding the potential exposures to inorganic concentrations in Cattail / Bailey Creek was provided in the Current Human Exposures Under Control Environmental Indicator previously submitted to USEPA.

Therefore the potential discharge of "contaminated" groundwater into surface water is currently acceptable.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__X__ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

Additional liquid level measurements and groundwater samples will be collected from the nine (9) monitoring wells installed during the Phase II investigation: WWL-1 through WWL-3L/3U, and LF-1 through LF-5. The list of analyzed constituents will be based on the list used for the Phase I and II sampling events, but may be modified to eliminate previously undetected compounds. Although the frequency and timing of sampling will be impacted by the progress of the Corrective Action program under the Facility Lead Agreement (FLA), sample collection is expected to occur at least annually.

The sampling of the above-described nine monitoring wells will be sufficient to verify the lack of migrating groundwater beneath the facility. However, additional monitoring wells may also be installed and sampled as part of continuing characterization or monitoring efforts associated with SWMUs under the FLA. During any groundwater sampling event, side-wide groundwater and surface water elevation data will also be collected from all existing groundwater monitoring wells and surface water monitoring points (SWMPs).

In addition, the Facility will also continue to sample and monitor its existing surface water outfalls in accordance with the requirements of its VPDES permit. Monitoring performed at facility outfalls includes outfalls 005 (East Bear Creek) and 006 (West Bear Creek); outfall locations are shown on ***Figure 1***.

Migration of Contaminated Groundwater Under Control
Environmental Indicator (EI) RCRIS code (CA750)

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **Aqualon** facility, EPA ID # **VAD003121928**, located at **1111 Hercules Road, Hopewell, Virginia**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater." This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by /s/ Date 09/23/04

Michael Zickler

Remedial Project Manager

Supervisor /s/ Date 09/27/04

Robert E. Greaves

Chief, General Operations Branch

Waste and Chemicals Management Division

Locations where References may be found:

All references have been included as attachments to this document.

Contact telephone and e-mail numbers

(name) William E. Perkinson

(phone #) (804) 541-4746

(e-mail) BPerkinson@herc.com

LIST OF ATTACHMENTS:

Attachment A:

Figure 1: Site Map

Figure 2: Groundwater Contour Map

Figure 3: Geologic Cross-sections

Attachment B:

Table 1: WWL Monitoring Well Detection Table

Table 2: LF Monitoring Well Detection Table

Table 3: RAB Monitoring Well Detection Table

Attachment C: Dilution Factor Calculation Worksheet

Attachment D: *Proposed Aquatic Life Benchmarks for Chemicals Detected at the Hercules-Aqualon Hopewell, Virginia Site*

Hercules, Inc. Aqualon Division

1111 Hercules Road
Hopewell, VA 23860
Congressional District 4
EPA ID #: VAD003121928
Site Property Area: 390 Acres
Last Updated: 10/05/2012

Current Progress at the Site

Hercules submitted the RCRA Facility Investigation Summary Report in November 2011. The RFI Summary Report includes the Human Health Risk Assessment and the Baseline Ecological Risk Assessment as Attachments A and B respectively. EPA approved the RCRA Facility Investigation Summary Report in a letter dated March 27, 2012. Hercules will submit a Corrective Measures Study in fall of 2012 as the next step under RCRA Corrective Action.

Site Description

The Hercules Aqualon site occupies a 390-acre parcel of land in Hopewell, VA and employs about 400 local residents. Hercules purchased the property in 1926 but the site has been used for industrial purposes since 1912 under various owners/operators. The Hercules Hopewell Plant is one of the largest cellulose derivative production facilities in the world. All of the finished products are based on cellulose, a raw material that comes from trees or cotton. The cellulose is swollen with sodium hydroxide (caustic) and reacted with one or more chemicals, depending on the product being manufactured. The resulting product is then purified, dried, and packaged.

Site Responsibility

RCRA Corrective Action activities at this facility are being conducted under the direction of EPA Region 3.

Contaminants

Several organic and inorganic contaminants have been detected in ground water at the site. The contaminants of most concern include diethyl ether, tert butyl alcohol, 1,4-dioxane, and 2-butoxyethanol. Soil investigations have shown several organic and inorganic contaminants at several solid waste management units.

Institutional Controls

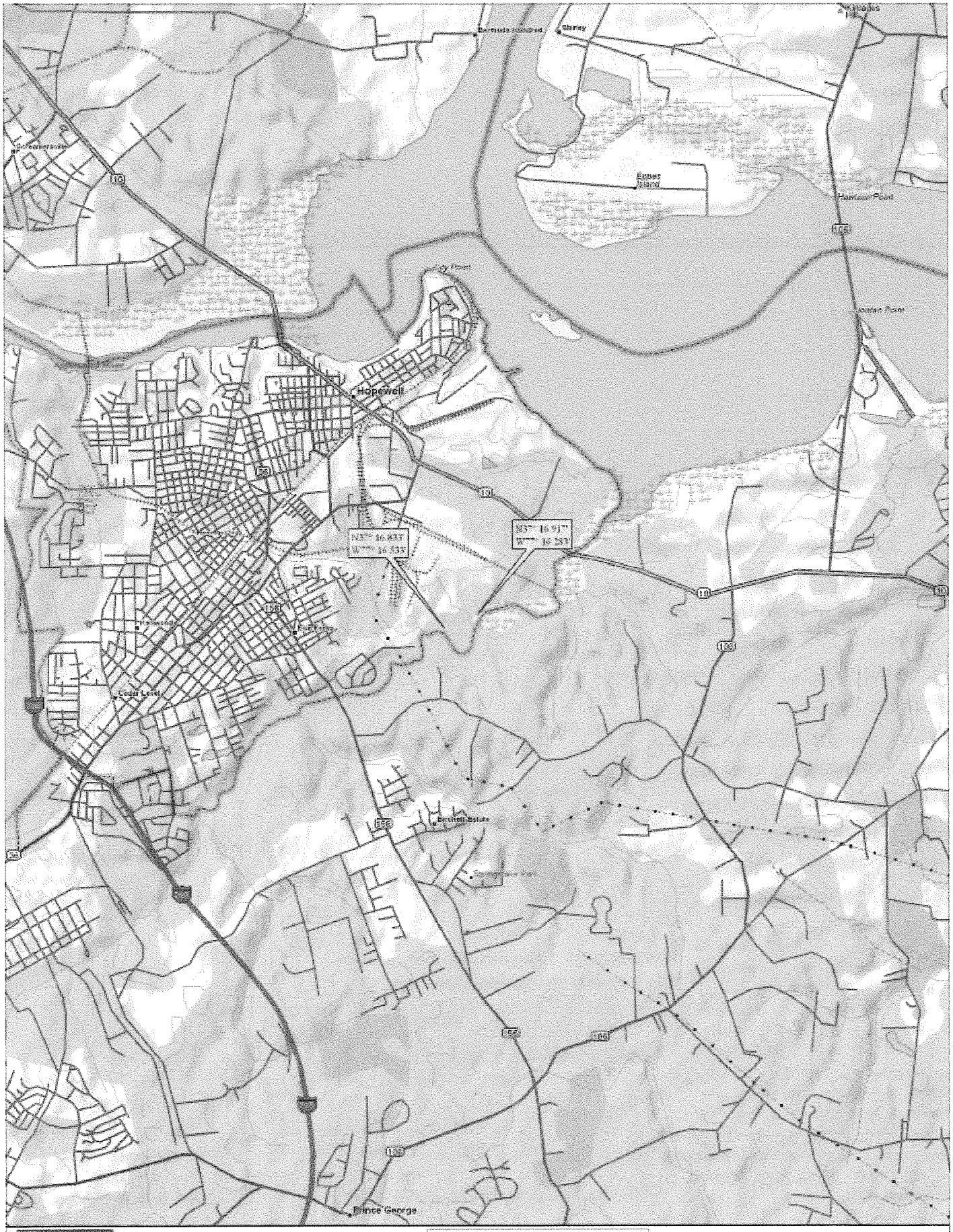
No institutional controls are currently in place.

Government Contacts

EPA Project Manager
Mr. Michael Jacobi - 3LC20
U.S. Environmental Protection Agency - Region III
1650 Arch Street
Philadelphia, PA 19103-2029
Phone: (215) 814-3435
Email: jacobi.michael@epa.gov

Jutta Schneider
Program Manager, RCRA Corrective Action and Groundwater
DEQ Office of Remediation Programs
629 East Main Street
Richmond, VA 23219
Phone: (804) 698-4099
Email: jutta.schneider@deq.virginia.gov

For more information about EPA's corrective action web page, including Environmental Indicators, please visit our site at: www.epa.gov/reg3wcmd/correctiveaction.htm



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
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Doug Domenech
Secretary of Natural Resources

David K. Paylor
Director

April 6, 2010

Mr. Carl Bostaph,
Plant Manager
Hercules Inc. – Aqualon Division
1111 Hercules Road
Hopewell, VA 23860

Re: VPDES Permit Inspection; Permit No. VA0003492 – Hercules Inc. – Aqualon Division

Dear Mr. Bostaph,

Enclosed are the reports for the subject inspection conducted on March 31, 2010. There are no "Required Corrective Actions" with regard to the Facility Inspection Report or "Deficiencies" with regard to the Laboratory Inspection Report.

Please note the **"General Recommendations"** on page 6 of the Facility Inspection Report. While not a requirement, performance of the indicated evaluations is strongly recommended. A response to the **"General Recommendations"** is not required.

If you have questions regarding the reports, please contact me at (804) 527-5055.

Sincerely,

Mike Dare

Mike Dare
Water Inspector

Enclosure
CC: DEQ – File
B. Perkinson
S. Spence

Virginia Department of Environmental Quality

WASTEWATER FACILITY INSPECTION REPORT

FACILITY NAME: Hercules Inc. (Aqualon Division)		**INSPECTION DATE:**	March 31, 2010
		INSPECTOR	Mike Dare MD 4-5-10
PERMIT No.: VA0003492		**REPORT DATE:**	April 5, 2010
TYPE OF FACILITY: ☐ Municipal ☐ Small Minor ☑ Industrial ☐ Federal		**TIME OF INSPECTION:**	Arrival 0900 hrs / Departure 1408 hrs
		TOTAL TIME SPENT (including prep & travel)	16 hours
PHOTOGRAPHS: ☑ Yes ☐ No		**UNANNOUNCED INSPECTION?**	☐ Yes ☑ No
REVIEWED BY / Date: C. Stitzy 4-5-10 A. Devaney 4.6.10			
PRESENT DURING INSPECTION: Bill Perkinson, Bill Shelley, Jimmy Wiseman, Steve Spence			

TECHNICAL INSPECTION

1. Has there been any new construction? • If so, were plans and specifications approved? Comments:	☐ Yes ☑ No
2. Is the Operations and Maintenance Manual approved and up-to-date? Comments: Most recent revision submitted to DEQ October 14, 2008	☑ Yes ☐ No
3. Are the Permit and/or Operation and Maintenance Manual specified licensed operator being met? Comments: Permit does not require a licensed Operator	☑ Yes ☐ No
4. Are the Permit and/or Operation and Maintenance Manual specified operator staffing requirements being met? Comments: At least one Environmental Technician is on site at all times	☑ Yes ☐ No
5. Is there an established and adequate program for training personnel? Comments:	☑ Yes ☐ No
6. Are preventive maintenance task schedules being met? Comments: The PM system is computer based	☑ Yes ☐ No
7. Does the plant experience any organic or hydraulic overloading? Comments: Facility generates wastewater and sends to Hopewell Regional WWTP	☐ Yes ☑ No
8. Has there been any bypassing or overflows since the last inspection? Comments: Industrial wastewater and stormwater overflowed from the Cellulose Derivatives Lift and Neutralization Station Rain Containment to Internal Outfall 601 on 7/13/05 and 8/15/05 due to lightning induced pump problems, on 10/7/06, 10/24/07, 4/20/09, 12/2/09 and 3/29/10 due to unusually heavy rain and on 5/6/09 due to 1 of 3 pumps being out of service at the time of a heavy rainfall event	☑ Yes ☐ No
9. Is the standby generator (including power transfer switch) operational and exercised regularly? Comments: N/A - Facility is served by a dual power supply system	☐ Yes ☐ No
10. Is the plant alarm system operational and tested regularly? Comments: Alarm system not evaluated	☐ Yes ☐ No

VA DEQ Wastewater Facility Inspection Report

Permit #	VA0003492

TECHNICAL INSPECTION

11. Is sludge disposed of in accordance with the approved sludge management plan? Comments:	☑ Yes ☐ No
12. Is septage received? • If so, is septage loading controlled, and are appropriate records maintained? Comments:	☐ Yes ☑ No
13. Are all plant records (operational logs, equipment maintenance, industrial waste contributors, sampling and testing) available for review and are records adequate? Comments:	☑ Yes ☐ No

14. Which of the following records does the plant maintain?

☑ Operational logs ☑ Instrument maintenance & calibration

☑ Mechanical equipment maintenance ☐ Industrial Waste Contribution (Municipal facilities)

Comments:

15. What does the operational log contain?

☑ Visual observations ☑ Flow Measurement ☑ Laboratory results ☐ Process adjustments

☐ Control calculations ☐ Other (specify)

Comments: Flow measurements and Laboratory results maintained separately

16. What do the mechanical equipment records contain?

☑ As built plans and specs ☑ Manufacturers instructions ☑ Lubrication schedules

☑ Spare parts inventory ☐ Equipment/parts suppliers

☐ Other (specify)

Comments:

17. What do the industrial waste contribution records contain (Municipal only)?

☐ Waste characteristics ☐ Impact on plant ☐ Locations and discharge types

☐ Other (specify)

Comments: N/A

18. Which of the following records are kept at the plant and available to personnel?

☑ Equipment maintenance records ☑ Operational log ☐ Industrial contributor records

☑ Instrumentation records ☑ Sampling and testing records

Comments:

19. List records not normally available to plant personnel and their location:

Comments: N/A

20. Are the records maintained for the required time period (three or five years)? Comments:	☑ Yes ☐ No

VA DEQ Wastewater Facility Inspection Report

Permit #	VA0003492

UNIT PROCESS EVALUATION SUMMARY SHEET

UNIT PROCESS	APPLICABLE	PROBLEMS*	COMMENTS
Sewage Pumping			
Flow Measurement (Influent)			
Screening/Comminution			
Grit Removal			
Oil/Water Separator			
Flow Equalization			
Ponds/Lagoons			
Imhoff Tank			
Primary Sedimentation			
Trickling Filter			
Septic Tank and Sand Filter			
Rotating Biological Contactor			
Activated Sludge Aeration			
Biological Nutrient Removal			
Sequencing Batch Reactor			
Secondary Sedimentation			
Flocculation			
Tertiary Sedimentation			
Filtration			
Micro-Screening			
Activated Carbon Adsorption			
Chlorination			
Dechlorination			
Ozonation			
Ultraviolet Disinfection			
Post Aeration	Y		
Flow Measurement (Effluent)	Y		*Estimated*
Land Application (Effluent)			
Plant Outfall	Y		
Sludge Pumping			
Flotation Thickening (DAF)			
Gravity Thickening			
Aerobic Digestion			
Anaerobic Digestion			
Lime Stabilization			
Centrifugation			
Sludge Press			
Vacuum Filtration			
Drying Beds			
Thermal Treatment			
Incineration			
Composting			
Land Application (Sludge)			

* Problem Codes

1. Unit Needs Attention
2. Abnormal Influent/Effluent
3. Evidence of Equipment Failure
4. Unapproved Modification or Temporary Repair
5. Evidence of Process Upset
6. Other (explain in comments)

INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

The Aqualon Division of Hercules manufacturers a food grade cellulose product that is used in the production of pharmaceutical and food products. Industrial and sanitary wastewater generated at the facility is discharged to the Hopewell Regional Wastewater Treatment Plant. Dry weather and stormwater flows are monitored at several outfall locations:

Outfall 601 – Internal stormwater/groundwater outfall; discharge is to outfall 006
Outfall 013 – Sediment basin for inert debris landfill; No discharge from this outfall since the late 1990's
Outfall 005 – Receives groundwater, stormwater runoff, steam condensate, firewater
Outfall 006 – Receives groundwater, stormwater runoff, steam condensate, firewater, chemical tank non-contact cooling water, overflow from former treatment lagoons
Outfall 905 – Wet weather flow at Outfall 005
Outfall 906 – Wet weather flow at Outfall 006

The discharge from Outfalls 005/905 and 006/906 is to a tributary of Bailey Creek.

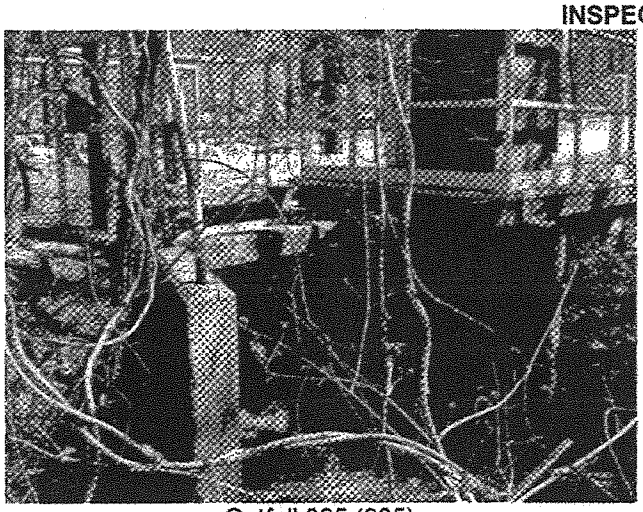
Permit VA0003492 includes Stormwater Pollution Plan Requirements. The requirements are addressed in a Surface Water Pollution Plan/BMP manual. The Stormwater Annual Comprehensive Site Compliance Evaluation was last performed on November 30, 2009. Documentaion of quarterly visual examinations is maintained in the laboratory. Results of examinations reviewed at the time of inspection indicated little to no impact on the stormwater.

As required by the permit, the permittee has conducted a thorough investigation into the source of the dissolved Zinc in the discharges at Outfall 005/905. Results of the investigation indicate that if acidic flow from the adjoining CSX rail yard were eliminated, dissolved Zinc contamination at Outfall 005/905 would be minimized. Rehabilitaion of a storm sewer pipe running through the CSX site has been recommended by a consultant involved in the investigation. Lime is added to the stormwater system to neutralize the acidic flow from off site.

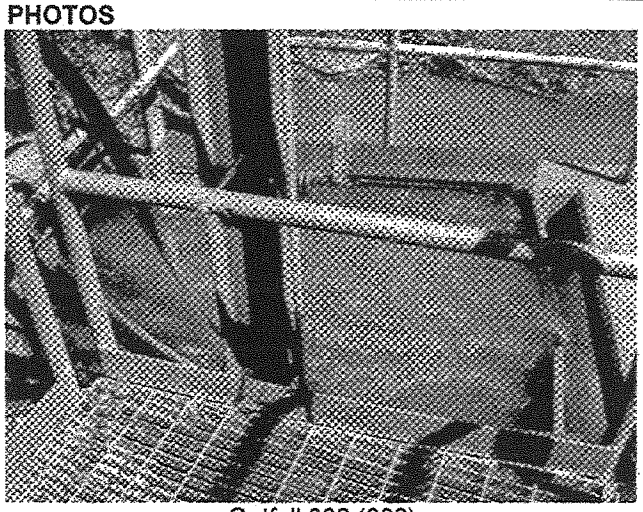
Three former treatment lagoons were viewed at the time of inspection. The lagoons continue to hold rainwater. Large woody vegetation was prevalent on the lagoon berms and dams. The water level in one of the lagoons was even with the top of the dam. These conditions have the potential to compromise the structural integrity of the lagoon berms and dams and would be indicated as a problem requiring correction if the lagoons were part of an active treatment system. See "General Recommendations."

Five overflows of the Cellulose Derivatives Lift and Neutralization Station Rain Containment to Internal Outfall 601 were noted to have occurred between October 2006 and March 2010, due to heavy rain events. See "General Recommendations."

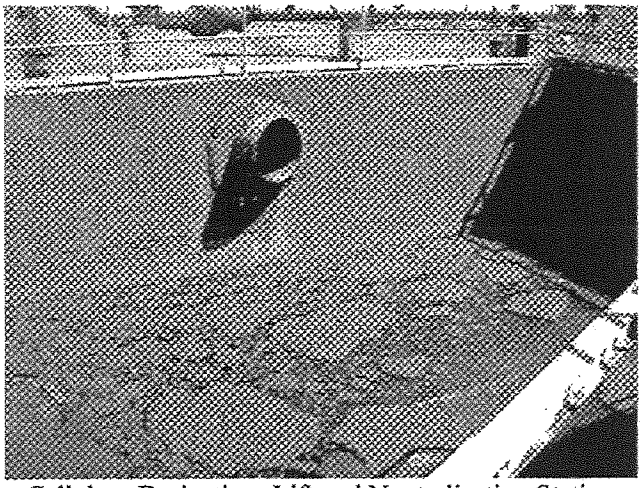
INSPECTION PHOTOS



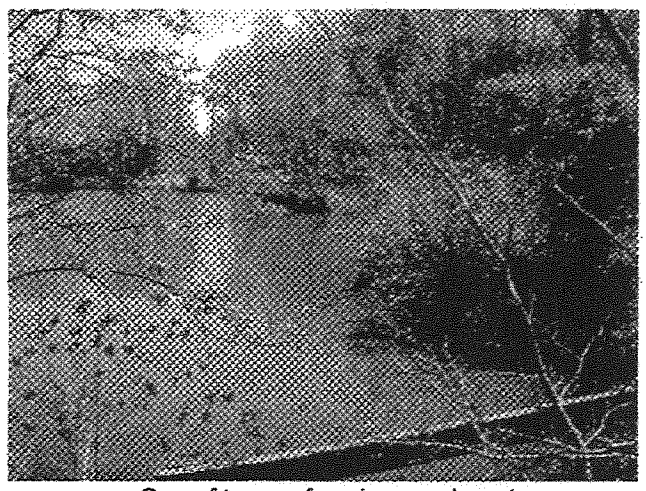
Outfall 005 (905)
Weir is at center of photo
Discharge was cloudy due to recent heavy rainfall



Outfall 006 (906)
Weir is at center-right of photo
Discharge was cloudy due to recent heavy rainfall

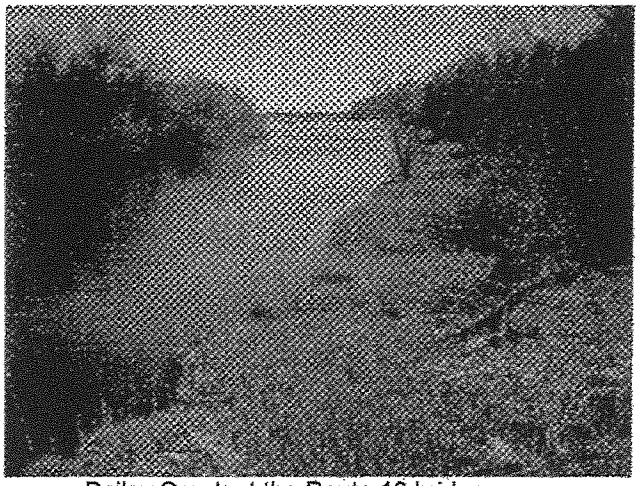


Cellulose Derivatives Lift and Neutralization Station
Rain Containment



One of two surface impoundments
Treatment lagoons from the distant past
Large woody vegetation is prevalent on dam and berms

"Natrosol Lagoon"
Treatment lagoon from the distant past
Lagoon water level was even with top of dam



Bailey Creek at the Route 10 bridge,
below Hercules' Outfalls

VA DEQ Wastewater Facility Inspection Report

Permit #	VA0003492

EFFLUENT FIELD DATA: O/F 005/006; DO & temp by M. Dare, pH by Hercules; Flow not obtained

Flow	MGD	**Dissolved Oxygen**	9.4/10.8 mg/L	**TRC (Contact Tank)**	N/A mg/L
pH	6.7/7.2 S.U.	**Temperature**	14/14 °C	**TRC (Final Effluent)**	N/A mg/L

Was a Sampling Inspection conducted? ☐ Yes (see Sampling Inspection Report) ☑ No

CONDITION OF OUTFALL AND EFFLUENT CHARACTERISTICS:

1. Type of outfall: ☑ Shore based ☐ Submerged Diffuser? ☐ Yes ☑ No
2. Are the outfall and supporting structures in good condition? ☑ Yes ☐ No
3. Final Effluent (evidence of following problems): ☐ Sludge bar ☐ Grease ☐ Turbid effluent ☐ Visible foam ☐ Unusual color ☐ Oil sheen
4. Is there a visible effluent plume in the receiving stream? ☐ Yes ☑ No
5. Receiving stream: ☑ No observed problems ☐ Indication of problems (explain below)

Comments: Discharge is to a tributary of Bailey Creek

GENERAL RECOMMENDATIONS (Not a requirement):

1. It is recommended that the integrity of former treatment lagoon berms and dams be evaluated by a qualified person. Appropriate measures should be taken based on results of the evaluation.
2. It is recommended that the Cellulose Derivatives Lift and Neutralization Station Rain Containment system be evaluated to see if measures can be taken to reduce the frequency of overflows during heavy rain events.

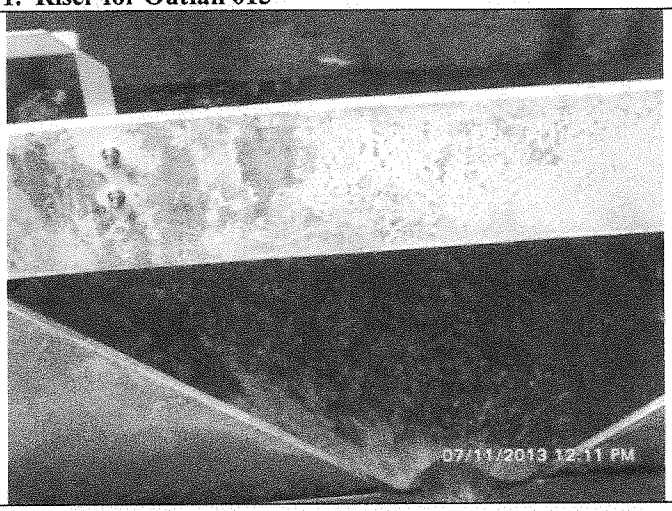
REQUIRED CORRECTIVE ACTIONS:

None

Hercules Incorporated Aqualon Division
VA0003492
Site Visit
11 Jul 2013

1. Riser for Outfall 013

2. Outfall 005



3. Weir at Outfall 005

4. Outfall 006

5. Receiving stream at Outfall 006

6. Receiving stream at Outfall 006

Ambient Stream Data
Monitoring Station 2-BLY000.65 (Bailey Creek)

Collection Date	Hardness (mg/L CaCO3)
01/31/2005 13:50	52
03/09/2005 14:05	54
05/31/2005 14:30	54
07/12/2005 14:10	40
09/19/2005 14:10	82
11/21/2005 13:00	60
01/25/2006 14:20	49
03/23/2006 13:20	62
05/09/2006 13:50	61
07/12/2006 12:50	39
09/19/2006 12:45	51
11/15/2006 12:50	32

Average:	53.0

Ambient Stream Data
Monitoring Station 2-BLY000.65 (Bailey Creek)

Collection Date	Temp (°C)	pH (S.U.)
31-Jan-05	3.27	7.01
9-Mar-05	11.99	7.12
31-May-05	24.65	6.95
12-Jul-05	30.07	6.59
19-Sep-05	32.53	7.49
21-Nov-05	12.1	7.18
25-Jan-06	12.42	6.9
25-Jan-06	7.98	7.12
13-Feb-06	14.32	6.98
13-Mar-06	23.5	7.1
23-Mar-06	11.8	6.9
11-Apr-06	16	6.8
9-May-06	19	7.2
9-May-06	21.2	7.1
6-Jun-06	26.1	7.6
12-Jul-06	29.9	6.7
17-Jul-06	30.1	7
15-Aug-06	26.9	7.1
12-Sep-06	23.3	6.8
19-Sep-06	25.3	6.8
17-Oct-06	17.5	6.9
8-Nov-06	13.3	6.5
15-Nov-06	14.9	6.9
11-Dec-06	3.7	6.8
5-Feb-07	2.9	6.1
17-Apr-07	9.8	6.9
19-Jun-07	28.9	7
2-Aug-07	29.1	7.1
3-Oct-07	25.5	6.9
6-Dec-07	10.2	7.2
6-Feb-08	13.2	7.1
16-Apr-08	13.7	6.9
18-Jun-08	24.6	6.9
26-Jun-08	33.6	8.1
10-Jul-08	26.6	7.8
21-Jul-08	37.6	9.3
22-Jul-08	37.1	9.1
6-Aug-08	33	8.1
6-Aug-08	35.2	7.9
13-Aug-08	25.7	7.4
19-Aug-08	34.4	8.8
3-Sep-08	34.5	8

4-Sep-08	33.4	8.7
14-Oct-08	23	7.1
18-Dec-08	9.6	6.7
12-Jan-09	6.6	6.8
9-Mar-09	15	6.9
16-Apr-09	16.6	6.8
13-May-09	22.3	6.9
20-May-09	23.8	7.2
7-Jul-09	24.7	6.9
4-Aug-09	32	8.3
5-Aug-09	31.2	8.1
10-Aug-09	36.9	8.6
20-Aug-09	34.2	8.6
26-Aug-09	30.9	6.8
16-Sep-09	24.1	6.9
4-Nov-09	13.4	7
11-Feb-10	1.5	
20-Apr-10	18.9	7.2
7-Jun-10	25.8	6.9
15-Jul-10	37.4	8.5
22-Jul-10	31.4	8.1
26-Jul-10	34.6	9.2
16-Aug-10	26.9	7.1
25-Oct-10	15.7	6.8
8-Dec-10	1.3	6.9
16-Feb-11	11	7
4-Apr-11	14.3	6.7
14-Jun-11	30.1	7.7
3-Aug-11	29.5	6.8
11-Oct-11	22.4	7.1
7-Dec-11	16.15	7.14
23-Jan-12	7.62	6.87
7-Mar-12	11.11	7
10-May-12	18.43	6.72
5-Jul-12	29.63	7.05
10-Sep-12	26.44	7.59
13-Nov-12	17.58	7.39

90th Percentile:	34.2	8.4
10th Percentile:	9.3	6.8

90th Percentile Wet Season:	15.7

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Hercules Aqualon 005 Permit No.: VA0003492

Receiving Stream: Baileys Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	53	mg/L
90% Temperature (Annual) =	34.2	deg C
90% Temperature (Wet season) =	15.7	deg C
90% Maximum pH =	8.4	SU
10% Maximum pH =	6.8	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	1.1	MGD
7Q10 (Annual) =	1.2	MGD
30Q10 (Annual) =	1.7	MGD
1Q10 (Wet season) =	4	MGD
30Q10 (Wet season)	5	MGD
30Q5 =	2.2	MGD
Harmonic Mean =		MGD

Mixing Information

Annual - 1Q10 Mix =	8.43	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	27.66	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	190.5	mg/L
90% Temp (Annual) =	25	deg C
90% Temp (Wet season) =	15	deg C
90% Maximum pH =	7.5	SU
10% Maximum pH =	6.8	SU
Discharge Flow =	0.132	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Acenapthene	0	--	--	na	9.9E+02	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+04
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	--	--	na	1.6E+02
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	5.1E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	**5.1E+00**	--	na	**5.0E-04**
Ammonia-N (mg/l) (Yearly)	0	1.46E+01	5.06E-01	na	--	2.48E+01	7.03E+00	na	--	--	--	--	--	--	--	--	--	**2.48E+01**	**7.03E+00**	na	--
Ammonia-N (mg/l) (High Flow)	0	6.20E+00	1.35E+00	na	--	5.81E+01	5.24E+01	na	--	--	--	--	--	--	--	--	--	**5.81E+01**	**5.24E+01**	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	7.1E+05	--	--	--	--	--	--	--	--	--	--	na	7.1E+05
Antimony	0	--	--	na	6.4E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
Arsenic	0	3.4E+02	1.5E+02	na	--	5.8E+02	1.5E+03	na	--	--	--	--	--	--	--	--	--	**5.8E+02**	**1.5E+03**	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+02
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-03
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-01
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+00
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	1.1E+06	--	--	--	--	--	--	--	--	--	--	na	1.1E+06
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+01
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+03
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	3.4E+04	--	--	--	--	--	--	--	--	--	--	na	3.4E+04
Cadmium	0	5.4E+00	8.2E-01	na	--	9.3E+00	8.3E+00	na	--	--	--	--	--	--	--	--	--	**9.3E+00**	**8.3E+00**	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+01
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	4.1E+00	4.3E-02	na	8.1E-03	--	--	--	--	--	--	--	--	**4.1E+00**	**4.3E-02**	na	**8.1E-03**
Chloride	0	8.6E+05	2.3E+05	na	--	1.5E+06	2.3E+06	na	--	--	--	--	--	--	--	--	--	**1.5E+06**	**2.3E+06**	na	--
TRC	0	1.9E+01	1.1E+01	na	--	3.2E+01	1.1E+02	na	--	--	--	--	--	--	--	--	--	**3.2E+01**	**1.1E+02**	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	2.8E+04	--	--	--	--	--	--	--	--	--	--	na	2.8E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.9E+05	--	--	--	--	--	--	--	--	--	--	na	1.9E+0
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	2.8E+04	--	--	--	--	--	--	--	--	--	--	na	2.8E+0
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	na	2.7E+0
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	1.4E-01	4.1E-01	na	--	--	--	--	--	--	--	--	--	1.4E-01	4.1E-01	na	--
Chromium III	0	7.2E+02	5.3E+01	na	--	1.2E+03	5.4E+02	na	--	--	--	--	--	--	--	--	--	1.2E+03	5.4E+02	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	2.7E+01	1.1E+02	na	--	--	--	--	--	--	--	--	--	2.7E+01	1.1E+02	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Copper	0	1.8E+01	6.3E+00	na	--	3.0E+01	6.4E+01	na	--	--	--	--	--	--	--	--	--	3.0E+01	6.4E+01	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	3.7E+01	5.2E+01	na	2.8E+05	--	--	--	--	--	--	--	--	3.7E+01	5.2E+01	na	2.8E+0
DDD [C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-0
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-0
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.9E+00	1.0E-02	na	2.2E-03	--	--	--	--	--	--	--	--	1.9E+00	1.0E-02	na	2.2E-0
Demeton	0	--	1.0E-01	na	--	--	1.0E+00	na	--	--	--	--	--	--	--	--	--	--	1.0E+00	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	2.9E-01	1.7E+00	na	--	--	--	--	--	--	--	--	--	2.9E-01	1.7E+00	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	2.3E+04	--	--	--	--	--	--	--	--	--	--	na	2.3E+0
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+0
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	3.4E+03	--	--	--	--	--	--	--	--	--	--	na	3.4E+0
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-0
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+0
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+0
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	1.3E+05	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.8E+05	--	--	--	--	--	--	--	--	--	--	na	1.8E+0
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	5.1E+03	--	--	--	--	--	--	--	--	--	--	na	5.1E+0
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+0
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	4.1E-01	5.7E-01	na	5.4E-04	--	--	--	--	--	--	--	--	4.1E-01	5.7E-01	na	5.4E-04
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	7.8E+05	--	--	--	--	--	--	--	--	--	--	na	7.8E+0
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.5E+04	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.9E+07	--	--	--	--	--	--	--	--	--	--	na	1.9E+0
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	8.0E+04	--	--	--	--	--	--	--	--	--	--	na	8.0E+0
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	9.4E+04	--	--	--	--	--	--	--	--	--	--	na	9.4E+0
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	4.9E+03	--	--	--	--	--	--	--	--	--	--	na	4.9E+0
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+0
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	9.0E-07	--	--	--	--	--	--	--	--	--	--	na	9.0E-07
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+0
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	3.7E-01	5.7E-01	na	1.6E+03	--	--	--	--	--	--	--	--	3.7E-01	5.7E-01	na	1.6E+0
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	3.7E-01	5.7E-01	na	1.6E+03	--	--	--	--	--	--	--	--	3.7E-01	5.7E-01	na	1.6E+0
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.7E-01	5.7E-01	--	--	--	--	--	--	--	--	--	--	3.7E-01	5.7E-01	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.6E+03	--	--	--	--	--	--	--	--	--	--	na	1.6E+0
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	1.5E-01	3.6E-01	na	1.1E+00	--	--	--	--	--	--	--	--	1.5E-01	3.6E-01	na	1.1E+0
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+0

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	3.7E+04	--	--	--	--	--	--	--	--	--	--	na	3.7E+0
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	2.5E+03	--	--	--	--	--	--	--	--	--	--	na	2.5E+0
Fluorene	0	--	--	na	5.3E+03	--	--	na	9.4E+04	--	--	--	--	--	--	--	--	--	--	na	9.4E+0
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	1.0E-01	na	--	--	--	--	--	--	--	--	--	--	1.0E-01	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	7.9E-04	8.9E-01	3.8E-02	na	7.9E-04	--	--	--	--	--	--	--	--	8.9E-01	3.8E-02	na	7.9E-0
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	8.9E-01	3.8E-02	na	3.9E-04	--	--	--	--	--	--	--	--	8.9E-01	3.8E-02	na	3.9E-0
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-0
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+0
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-0
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-0
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	1.6E+00	--	na	1.8E+00	--	--	--	--	--	--	--	--	1.6E+00	--	na	1.8E+0
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.9E+04	--	--	--	--	--	--	--	--	--	--	na	1.9E+0
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+0
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	2.0E+01	na	--	--	--	--	--	--	--	--	--	--	2.0E+01	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+0
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	1.7E+02	8.1E+00	na	--	2.9E+02	8.1E+01	na	--	--	--	--	--	--	--	--	--	2.9E+02	8.1E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	1.0E+00	na	--	--	--	--	--	--	--	--	--	--	1.0E+00	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	2.4E+00	7.8E+00	- -	- -	--	--	--	--	--	--	--	--	2.4E+00	7.8E+00	- -	- -
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	2.7E+04	--	--	--	--	--	--	--	--	--	--	na	2.7E+0
Methylene Chloride [c]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+0
Methoxychlor	0	--	3.0E-02	na	--	--	3.0E-01	na	--	--	--	--	--	--	--	--	--	--	3.0E-01	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	2.3E+02	1.4E+01	na	4.6E+03	4.0E+02	1.5E+02	na	8.1E+04	--	--	--	--	--	--	--	--	4.0E+02	1.5E+02	na	8.1E+0
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+0
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+0
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+0
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+0
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.8E+01	6.7E+01	na	--	--	--	--	--	--	--	--	--	4.8E+01	6.7E+01	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	1.1E-01	1.3E-01	na	--	--	--	--	--	--	--	--	--	1.1E-01	1.3E-01	na	--
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	1.4E-01	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.4E-01	na	6.4E-0
Pentachlorophenol [c]	0	7.1E+00	5.5E+00	na	3.0E+01	1.2E+01	5.5E+01	na	3.0E+01	--	--	--	--	--	--	--	--	1.2E+01	5.5E+01	na	3.0E+0
Phenol	0	--	--	na	8.6E+05	--	--	na	1.5E+07	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
Pyrene	0	--	--	na	4.0E+03	--	--	na	7.1E+04	--	--	--	--	--	--	--	--	--	--	na	7.1E+0
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	7.1E+01	--	--	--	--	--	--	--	--	--	--	na	7.1E+0
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	3.4E+01	5.0E+01	na	7.4E+04	--	--	--	--	--	--	--	--	**3.4E+01**	**5.0E+01**	**na**	**7.4E+0**
Silver	0	5.7E+00	--	na	--	9.7E+00	--	na	--	--	--	--	--	--	--	--	--	**9.7E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+0**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+0**
Thallium	0	--	--	na	4.7E-01	--	--	na	8.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.3E+0**
Toluene	0	--	--	na	6.0E+03	--	--	na	1.1E+05	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.1E+0**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	1.2E+00	2.0E-03	na	2.8E-03	--	--	--	--	--	--	--	--	**1.2E+00**	**2.0E-03**	**na**	**2.8E-0**
Tributyltin	0	4.6E-01	7.2E-02	na	--	7.8E-01	7.3E-01	na	--	--	--	--	--	--	--	--	--	**7.8E-01**	**7.3E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+0**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+0**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+0**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+0**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+0**
Zinc	0	1.5E+02	8.4E+01	na	2.6E+04	2.6E+02	8.5E+02	na	4.6E+05	--	--	--	--	--	--	--	--	**2.6E+02**	**8.5E+02**	**na**	**4.6E+0**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	1.1E+04
Arsenic	2.3E+02
Barium	na
Cadmium	3.7E+00
Chromium III	3.2E+02
Chromium VI	1.1E+01
Copper	1.2E+01
Iron	na
Lead	4.9E+01
Manganese	na
Mercury	9.5E-01
Nickel	8.7E+01
Selenium	1.4E+01
Silver	3.9E+00
Zinc	1.0E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Hercules Aqualon 006 Permit No.: VA0003492

Receiving Stream: Baileys Creek Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	53	mg/L
90% Temperature (Annual) =	34.2	deg C
90% Temperature (Wet season) =	15.7	deg C
90% Maximum pH =	8.4	SU
10% Maximum pH =	6.8	SU
Tier Designation (1 or 2) =	1	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	1.1	MGD
7Q10 (Annual) =	1.2	MGD
30Q10 (Annual) =	1.7	MGD
1Q10 (Wet season) =	4	MGD
30Q10 (Wet season)	5	MGD
30Q5 =	2.2	MGD
Harmonic Mean =		MGD

Mixing Information

Annual - 1Q10 Mix =	8.71	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	27.94	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	220.4	mg/L
90% Temp (Annual) =	25	deg C
90% Temp (Wet season) =	15	deg C
90% Maximum pH =	7.4	SU
10% Maximum pH =	7	SU
Discharge Flow =	0.178	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.2E+02	--	--	--	--	--	--	--	--	--	--	na	1.2E+0
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+0
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	4.6E+00	--	na	5.0E-04	--	--	--	--	--	--	--	--	4.6E+00	--	na	5.0E-0
Ammonia-N (mg/l) (Yearly)	0	1.80E+01	5.94E-01	na	--	2.77E+01	6.26E+00	na	--	--	--	--	--	--	--	--	--	2.77E+01	6.26E+00	na	--
Ammonia-N (mg/l) (High Flow)	0	7.64E+00	1.45E+00	na	--	5.56E+01	4.23E+01	na	--	--	--	--	--	--	--	--	--	5.56E+01	4.23E+01	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	5.3E+05	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
Antimony	0	--	--	na	6.4E+02	--	--	na	8.6E+03	--	--	--	--	--	--	--	--	--	--	na	8.6E+0
Arsenic	0	3.4E+02	1.5E+02	na	--	5.2E+02	1.2E+03	na	--	--	--	--	--	--	--	--	--	5.2E+02	1.2E+03	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	5.1E+02	--	--	--	--	--	--	--	--	--	--	na	5.1E+0
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	2.0E-03	--	--	--	--	--	--	--	--	--	--	na	2.0E-0
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	5.3E+00	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	8.7E+05	--	--	--	--	--	--	--	--	--	--	na	8.7E+0
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	2.2E+01	--	--	--	--	--	--	--	--	--	--	na	2.2E+0
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	1.4E+03	--	--	--	--	--	--	--	--	--	--	na	1.4E+0
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	2.5E+04	--	--	--	--	--	--	--	--	--	--	na	2.5E+0
Cadmium	0	6.8E+00	9.0E-01	na	--	1.0E+01	7.0E+00	na	--	--	--	--	--	--	--	--	--	1.0E+01	7.0E+00	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	1.6E+01	--	--	--	--	--	--	--	--	--	--	na	1.6E+0
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	3.7E+00	3.3E-02	na	8.1E-03	--	--	--	--	--	--	--	--	3.7E+00	3.3E-02	na	8.1E-0
Chloride	0	8.6E+05	2.3E+05	na	--	1.3E+06	1.8E+06	na	--	--	--	--	--	--	--	--	--	1.3E+06	1.8E+06	na	--
TRC	0	1.9E+01	1.1E+01	na	--	2.9E+01	8.5E+01	na	--	--	--	--	--	--	--	--	--	2.9E+01	8.5E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	--	--	na	2.1E+0

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.5E+05	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	2.1E+04	--	--	--	--	--	--	--	--	--	--	na	2.1E+0
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	2.0E+03	--	--	--	--	--	--	--	--	--	--	na	2.0E+0
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	1.3E-01	3.2E-01	na	--	--	--	--	--	--	--	--	--	1.3E-01	3.2E-01	na	--
Chromium III	0	8.5E+02	5.8E+01	na	--	1.3E+03	4.5E+02	na	--	--	--	--	--	--	--	--	--	1.3E+03	4.5E+02	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	2.5E+01	8.5E+01	na	--	--	--	--	--	--	--	--	--	2.5E+01	8.5E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	1.8E-02	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Copper	0	2.1E+01	7.0E+00	na	--	3.3E+01	5.4E+01	na	--	--	--	--	--	--	--	--	--	3.3E+01	5.4E+01	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	3.4E+01	4.0E+01	na	2.1E+05	--	--	--	--	--	--	--	--	3.4E+01	4.0E+01	na	2.1E+0
DDD [C]	0	--	--	na	3.1E-03	--	--	na	3.1E-03	--	--	--	--	--	--	--	--	--	--	na	3.1E-0
DDE [C]	0	--	--	na	2.2E-03	--	--	na	2.2E-03	--	--	--	--	--	--	--	--	--	--	na	2.2E-0
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	1.7E+00	7.7E-03	na	2.2E-03	--	--	--	--	--	--	--	--	1.7E+00	7.7E-03	na	2.2E-0
Demeton	0	--	1.0E-01	na	--	--	7.7E-01	na	--	--	--	--	--	--	--	--	--	--	7.7E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	2.6E-01	1.3E+00	na	--	--	--	--	--	--	--	--	--	2.6E-01	1.3E+00	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+0
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	2.5E+03	--	--	--	--	--	--	--	--	--	--	na	2.5E+0
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	2.8E-01	--	--	--	--	--	--	--	--	--	--	na	2.8E-0
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	1.7E+02	--	--	--	--	--	--	--	--	--	--	na	1.7E+0
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	3.7E+02	--	--	--	--	--	--	--	--	--	--	na	3.7E+0
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	9.5E+04	--	--	--	--	--	--	--	--	--	--	na	9.5E+0
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.3E+05	--	--	--	--	--	--	--	--	--	--	na	1.3E+0
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	3.9E+03	--	--	--	--	--	--	--	--	--	--	na	3.9E+0
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	1.5E+02	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	2.1E+02	--	--	--	--	--	--	--	--	--	--	na	2.1E+0
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	3.7E-01	4.3E-01	na	5.4E-04	--	--	--	--	--	--	--	--	3.7E-01	4.3E-01	na	5.4E-0
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	5.9E+05	--	--	--	--	--	--	--	--	--	--	na	5.9E+0
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+0
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.5E+07	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	6.0E+04	--	--	--	--	--	--	--	--	--	--	na	6.0E+0
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	7.1E+04	--	--	--	--	--	--	--	--	--	--	na	7.1E+0
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	3.7E+03	--	--	--	--	--	--	--	--	--	--	na	3.7E+0
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	3.4E+01	--	--	--	--	--	--	--	--	--	--	na	3.4E+0
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	6.8E-07	--	--	--	--	--	--	--	--	--	--	na	6.8E-07
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	2.0E+00	--	--	--	--	--	--	--	--	--	--	na	2.0E+0
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	3.4E-01	4.3E-01	na	1.2E+03	--	--	--	--	--	--	--	--	3.4E-01	4.3E-01	na	1.2E+0
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	3.4E-01	4.3E-01	na	1.2E+03	--	--	--	--	--	--	--	--	3.4E-01	4.3E-01	na	1.2E+0
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	3.4E-01	4.3E-01	--	--	--	--	--	--	--	--	--	--	3.4E-01	4.3E-01	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	--	--	na	1.2E+0
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	1.3E-01	2.8E-01	na	8.0E-01	--	--	--	--	--	--	--	--	1.3E-01	2.8E-01	na	8.0E-01
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	4.0E+00	--	--	--	--	--	--	--	--	--	--	na	4.0E+0

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.8E+04	--	--	--	--	--	--	--	--	--	--	na	2.8E+0
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+0
Fluorene	0	--	--	na	5.3E+03	--	--	na	7.1E+04	--	--	--	--	--	--	--	--	--	--	na	7.1E+0
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	7.7E-02	na	--	--	--	--	--	--	--	--	--	--	7.7E-02	na	--
Heptachlor [c]	0	5.2E-01	3.8E-03	na	7.9E-04	8.0E-01	2.9E-02	na	7.9E-04	--	--	--	--	--	--	--	--	8.0E-01	2.9E-02	na	7.9E-0
Heptachlor Epoxide[c]	0	5.2E-01	3.8E-03	na	3.9E-04	8.0E-01	2.9E-02	na	3.9E-04	--	--	--	--	--	--	--	--	8.0E-01	2.9E-02	na	3.9E-0
Hexachlorobenzene[c]	0	--	--	na	2.9E-03	--	--	na	2.9E-03	--	--	--	--	--	--	--	--	--	--	na	2.9E-0
Hexachlorobutadiene[c]	0	--	--	na	1.8E+02	--	--	na	1.8E+02	--	--	--	--	--	--	--	--	--	--	na	1.8E+0
Hexachlorocyclohexane Alpha-BHC[c]	0	--	--	na	4.9E-02	--	--	na	4.9E-02	--	--	--	--	--	--	--	--	--	--	na	4.9E-0
Hexachlorocyclohexane Beta-BHC[c]	0	--	--	na	1.7E-01	--	--	na	1.7E-01	--	--	--	--	--	--	--	--	--	--	na	1.7E-0
Hexachlorocyclohexane Gamma-BHC[c] (Lindane)	0	9.5E-01	na	na	1.8E+00	1.5E+00	--	na	1.8E+00	--	--	--	--	--	--	--	--	1.5E+00	--	na	1.8E+0
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.5E+04	--	--	--	--	--	--	--	--	--	--	na	1.5E+0
Hexachloroethane[c]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	--	--	na	3.3E+0
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.5E+01	na	--	--	--	--	--	--	--	--	--	--	1.5E+01	na	--
Indeno (1,2,3-cd) pyrene [c]	0	--	--	na	1.8E-01	--	--	na	1.8E-01	--	--	--	--	--	--	--	--	--	--	na	1.8E-0
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[c]	0	--	--	na	9.6E+03	--	--	na	9.6E+03	--	--	--	--	--	--	--	--	--	--	na	9.6E+0
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	2.2E+02	9.3E+00	na	--	3.4E+02	7.2E+01	na	--	--	--	--	--	--	--	--	--	3.4E+02	7.2E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	7.7E-01	na	--	--	--	--	--	--	--	--	--	--	7.7E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	- -	- -	2.2E+00	6.0E+00	- -	- -	--	--	--	--	--	--	--	--	2.2E+00	6.0E+00	- -	- -
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+0
Methylene Chloride [c]	0	--	--	na	5.9E+03	--	--	na	5.9E+03	--	--	--	--	--	--	--	--	--	--	na	5.9E+0
Methoxychlor	0	--	3.0E-02	na	--	--	2.3E-01	na	--	--	--	--	--	--	--	--	--	--	2.3E-01	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	2.7E+02	1.6E+01	na	4.6E+03	4.2E+02	1.2E+02	na	6.1E+04	--	--	--	--	--	--	--	--	4.2E+02	1.2E+02	na	6.1E+0
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	9.2E+03	--	--	--	--	--	--	--	--	--	--	na	9.2E+0
N-Nitrosodimethylamine[c]	0	--	--	na	3.0E+01	--	--	na	3.0E+01	--	--	--	--	--	--	--	--	--	--	na	3.0E+0
N-Nitrosodiphenylamine[c]	0	--	--	na	6.0E+01	--	--	na	6.0E+01	--	--	--	--	--	--	--	--	--	--	na	6.0E+0
N-Nitrosodi-n-propylamine[c]	0	--	--	na	5.1E+00	--	--	na	5.1E+00	--	--	--	--	--	--	--	--	--	--	na	5.1E+0
Nonylphenol	0	2.8E+01	6.6E+00	--	--	4.3E+01	5.1E+01	na	--	--	--	--	--	--	--	--	--	4.3E+01	5.1E+01	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	1.0E-01	1.0E-01	na	--	--	--	--	--	--	--	--	--	1.0E-01	1.0E-01	na	--
PCB Total[c]	0	--	1.4E-02	na	6.4E-04	--	1.1E-01	na	6.4E-04	--	--	--	--	--	--	--	--	--	1.1E-01	na	6.4E-0
Pentachlorophenol [c]	0	8.0E+00	5.6E+00	na	3.0E+01	1.2E+01	4.3E+01	na	3.0E+01	--	--	--	--	--	--	--	--	1.2E+01	4.3E+01	na	3.0E+0
Phenol	0	--	--	na	8.6E+05	--	--	na	1.1E+07	--	--	--	--	--	--	--	--	--	--	na	1.1E+0
Pyrene	0	--	--	na	4.0E+03	--	--	na	5.3E+04	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	5.3E+01	--	--	--	--	--	--	--	--	--	--	na	5.3E+0
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				**Most Limiting Allocations**			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	**Acute**	**Chronic**	**HH (PWS)**	**HH**
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	3.1E+01	3.9E+01	na	5.6E+04	--	--	--	--	--	--	--	--	**3.1E+01**	**3.9E+01**	**na**	**5.6E+0**
Silver	0	7.9E+00	--	na	--	1.2E+01	--	na	--	--	--	--	--	--	--	--	--	**1.2E+01**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	4.0E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**4.0E+0**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	3.3E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.3E+0**
Thallium	0	--	--	na	4.7E-01	--	--	na	6.3E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**6.3E+0**
Toluene	0	--	--	na	6.0E+03	--	--	na	8.0E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.0E+0**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	1.1E+00	1.5E-03	na	2.8E-03	--	--	--	--	--	--	--	--	**1.1E+00**	**1.5E-03**	**na**	**2.8E-0**
Tributyltin	0	4.6E-01	7.2E-02	na	--	7.1E-01	5.6E-01	na	--	--	--	--	--	--	--	--	--	**7.1E-01**	**5.6E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	9.4E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**9.4E+0**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	1.6E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.6E+0**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	3.0E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**3.0E+0**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+0**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	2.4E+01	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.4E+0**
Zinc	0	1.8E+02	9.2E+01	na	2.6E+04	2.7E+02	7.1E+02	na	3.5E+05	--	--	--	--	--	--	--	--	**2.7E+02**	**7.1E+02**	**na**	**3.5E+0**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	8.6E+03
Arsenic	2.1E+02
Barium	na
Cadmium	4.2E+00
Chromium III	2.7E+02
Chromium VI	9.8E+00
Copper	1.3E+01
Iron	na
Lead	4.3E+01
Manganese	na
Mercury	8.6E-01
Nickel	7.3E+01
Selenium	1.2E+01
Silver	4.9E+00
Zinc	1.1E+02

Note: do not use QL's lower than th minimum QL's provided in agency guidance

DMR QA/QC

Permit #:VA0003492

Facility:Hercules Aqualon Incorporated Division

Outfall	Rec'd	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	Quantity Unit Lim	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
005	07-Apr-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.5	NL
005	10-May-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.2	NL
005	13-Jun-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7	NL
005	11-Jul-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.9	NL
005	05-Aug-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10.3	NL
005	12-Sep-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	91	NL
005	11-Oct-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	145.5	NL
005	10-Nov-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	45.9	NL
005	12-Dec-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	79.5	NL
005	11-Jan-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	31.2	NL
005	10-Feb-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.25	NL
005	13-Mar-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	49.4	NL
005	11-Apr-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	68.5	NL
005	11-May-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27.5	NL
005	12-Jun-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	32.6	NL
005	10-Jul-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14.5	NL
005	11-Aug-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13.2	NL
005	11-Sep-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	162.7	NL
005	11-Oct-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.01	NL
005	13-Nov-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20.04	NL
005	11-Dec-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2.89	NL
005	11-Jan-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.55	NL
005	12-Feb-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.35	NL
005	09-Mar-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.79	NL
005	10-Apr-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.75	NL
005	10-May-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.26	NL
005	11-Jun-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.73	NL
005	10-Jul-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2.64	NL
005	13-Aug-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.91	NL
005	11-Sep-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.76	NL
005	11-Oct-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.84	NL

005	13-Nov-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.89	NL
005	11-Dec-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.63	NL
005	14-Jan-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.21	NL
005	11-Feb-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.16	NL
005	11-Mar-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.63	NL
005	11-Apr-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	485	NL
005	12-May-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.83	NL
005	11-Jun-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.19	NL
005	11-Jul-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.13	NL
005	11-Aug-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2.84	NL
005	11-Sep-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.52	NL
005	14-Oct-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.77	NL
005	10-Nov-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.47	NL
005	11-Dec-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.08	NL
005	12-Jan-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2.09	NL
005	06-Feb-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2.57	NL
005	11-Mar-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2.54	NL
005	09-Apr-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.5	NL
005	11-May-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.2	NL
005	11-Jun-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.7	NL
005	13-Jul-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.6	NL
005	07-Aug-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.7	NL
005	11-Sep-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.2	NL
005	08-Oct-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.2	NL
005	12-Nov-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.8	NL
005	11-Dec-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.7	NL
005	11-Jan-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.4	NL
005	08-Feb-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.3	NL
005	11-Mar-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.1	NL
005	09-Apr-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.7	NL
005	10-May-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.6	NL
005	10-Jun-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.5	NL
005	12-Jul-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.7	NL
005	11-Aug-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.5	NL
005	13-Sep-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
005	12-Oct-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.7	NL
005	12-Nov-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL

005	13-Dec-2010	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	5	NL
005	11-Jan-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	17	NL
005	10-Feb-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	7	NL
005	14-Mar-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	29	NL
005	11-Apr-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	20	NL
005	11-May-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	21	NL
005	09-Jun-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	13	NL
005	11-Jul-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	39	NL
005	11-Aug-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	10	NL
005	09-Sep-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	10	NL
005	11-Oct-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	15	NL
005	14-Nov-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
005	12-Dec-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12	NL
005	10-Jan-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	13	NL
005	10-Feb-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	23	NL
005	09-Mar-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	17	NL
005	10-Apr-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	22	NL
005	10-May-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
005	11-Jun-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	24	NL
005	11-Jul-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
005	13-Aug-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	8	NL
005	11-Sep-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.1	NL
005	11-Oct-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.4	NL
005	13-Nov-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	1.2	NL
005	07-Dec-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	7.7	NL
005	11-Jan-2013	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	6.8	NL
005	07-Apr-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	22	NL
005	10-May-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
005	13-Jun-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
005	11-Jul-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	20	NL
005	05-Aug-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
005	12-Sep-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	315	NL
005	11-Oct-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	420	NL
005	10-Nov-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	120	NL
005	12-Dec-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	157	NL
005	11-Jan-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	96	NL
005	10-Feb-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	27	NL

005	13-Mar-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	123	NL
005	11-Apr-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	229	NL
005	11-May-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	123	NL
005	12-Jun-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	88	NL
005	10-Jul-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	50	NL
005	11-Aug-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	47	NL
005	11-Sep-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	436	NL
005	11-Oct-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
005	13-Nov-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	57	NL
005	11-Dec-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
005	11-Jan-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	12-Feb-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
005	09-Mar-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
005	10-Apr-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	46	NL
005	10-May-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	82	NL
005	11-Jun-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	44	NL
005	10-Jul-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<10	NL
005	13-Aug-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
005	11-Sep-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
005	11-Oct-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	53	NL
005	13-Nov-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	58	NL
005	11-Dec-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	42	NL
005	14-Jan-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
005	11-Feb-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
005	11-Mar-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	11-Apr-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1176	NL
005	12-May-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
005	11-Jun-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
005	11-Jul-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
005	11-Aug-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
005	11-Sep-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	31	NL
005	14-Oct-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
005	10-Nov-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
005	11-Dec-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
005	12-Jan-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
005	06-Feb-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
005	11-Mar-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	57	NL

005	09-Apr-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
005	11-May-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	11-Jun-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	13-Jul-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	07-Aug-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	11-Sep-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
005	08-Oct-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
005	12-Nov-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
005	11-Dec-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL
005	11-Jan-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	08-Feb-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	11-Mar-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	09-Apr-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
005	10-May-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
005	10-Jun-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	12-Jul-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	11-Aug-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<10	NL
005	13-Sep-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	15	NL
005	12-Oct-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL
005	12-Nov-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
005	13-Dec-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
005	11-Jan-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	10-Feb-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27	NL
005	14-Mar-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	56	NL
005	11-Apr-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	50	NL
005	11-May-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	42	NL
005	09-Jun-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	41	NL
005	11-Jul-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	96	NL
005	11-Aug-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
005	09-Sep-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	11-Oct-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
005	14-Nov-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	39	NL
005	12-Dec-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
005	10-Jan-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	31	NL
005	10-Feb-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	54	NL
005	09-Mar-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	32	NL
005	10-Apr-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	54	NL

005	10-May-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	32	NL
005	11-Jun-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	48	NL
005	11-Jul-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	45	NL
005	13-Aug-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
005	11-Sep-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	15	NL
005	11-Oct-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	13-Nov-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	07-Dec-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	59	NL
005	11-Jan-2013	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL
005	10-May-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7	NL
005	10-Nov-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	12-Jun-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	11-Oct-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	NR	NL
005	11-Mar-2008	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
005	12-Jan-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
005	06-Feb-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10	NL
005	06-Feb-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10	NL
005	11-May-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
005	08-Feb-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
005	11-Aug-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
005	10-Feb-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
005	14-Nov-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
005	10-Feb-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5	NL
005	13-Aug-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	07-Apr-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	185	NL
005	10-May-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	188	NL
005	13-Jun-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	202	NL
005	11-Jul-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	176	NL
005	05-Aug-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	133	NL
005	12-Sep-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	340	NL
005	11-Oct-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	119	NL
005	10-Nov-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	172	NL
005	12-Dec-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	45	NL
005	11-Jan-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	140	NL
005	10-Feb-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	147	NL
005	13-Mar-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	138	NL
005	11-Apr-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	124	NL

005	11-May-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	172	NL
005	12-Jun-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	145	NL
005	10-Jul-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	151	NL
005	11-Aug-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	172	NL
005	11-Sep-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	242	NL
005	11-Oct-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	173	NL
005	13-Nov-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	164	NL
005	11-Dec-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	206	NL
005	11-Jan-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	183	NL
005	12-Feb-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	186	NL
005	09-Mar-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	155	NL
005	10-Apr-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	190	NL
005	10-May-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	241	NL
005	11-Jun-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	175	NL
005	10-Jul-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	190	NL
005	13-Aug-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	206	NL
005	11-Sep-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	199	NL
005	11-Oct-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	210	NL
005	13-Nov-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	158	NL
005	11-Dec-2007	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1512	NL
005	14-Jan-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	136	NL
005	11-Feb-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	108	NL
005	11-Mar-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	129	NL
005	11-Apr-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	380	NL
005	12-May-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	148	NL
005	11-Jun-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	144	NL
005	11-Jul-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	112	NL
005	11-Aug-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	155	NL
005	11-Sep-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	224	NL
005	14-Oct-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	252	NL
005	10-Nov-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	240	NL
005	11-Dec-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	283	NL
005	12-Jan-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	155	NL
005	06-Feb-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	200	NL
005	11-Mar-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	154	NL
005	09-Apr-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	91	NL
005	11-May-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	161	NL

005	11-Jun-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	108	NL
005	13-Jul-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	160	NL
005	07-Aug-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	163	NL
005	11-Sep-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	170	NL
005	08-Oct-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	293	NL
005	12-Nov-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	158	NL
005	11-Dec-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	416	NL
005	11-Jan-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	127	NL
005	08-Feb-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	144	NL
005	11-Mar-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	118	NL
005	09-Apr-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	248	NL
005	10-May-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	237	NL
005	10-Jun-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	212	NL
005	12-Jul-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	223	NL
005	11-Aug-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	287	NL
005	13-Sep-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	258	NL
005	12-Oct-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	235	NL
005	12-Nov-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	101	NL
005	13-Dec-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	218	NL
005	11-Jan-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	121	NL
005	10-Feb-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	179	NL
005	14-Mar-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	170	NL
005	11-Apr-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	131	NL
005	11-May-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	179	NL
005	09-Jun-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	120	NL
005	11-Jul-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	216	NL
005	11-Aug-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	151	NL
005	09-Sep-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	196	NL
005	11-Oct-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	130	NL
005	14-Nov-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	301	NL
005	12-Dec-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	305	NL
005	10-Jan-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	215	NL
005	10-Feb-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	130	NL
005	09-Mar-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	90	NL
005	10-Apr-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	143	NL
005	10-May-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	142	NL
005	11-Jun-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	116	NL

005	11-Jul-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	119	NL
005	13-Aug-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	120	NL
005	11-Sep-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	112	NL
005	11-Oct-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	104	NL
005	13-Nov-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	120	NL
005	07-Dec-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	101	NL
005	11-Jan-2013	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	105	NL
										Average:		190.5	
005	07-Apr-2005	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	10-May-2005	PH	NULL	*********	NULL	*********	NULL	7.6	6	NULL	*********	7.6	9.0
005	13-Jun-2005	PH	NULL	*********	NULL	*********	NULL	7.7	6	NULL	*********	7.7	9.0
005	11-Jul-2005	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	05-Aug-2005	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
005	12-Sep-2005	PH	NULL	*********	NULL	*********	NULL	4.3	6	NULL	*********	7.8	9.0
005	11-Oct-2005	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	8.2	9.0
005	10-Nov-2005	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
005	12-Dec-2005	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	11-Jan-2006	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	10-Feb-2006	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	13-Mar-2006	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	11-Apr-2006	PH	NULL	*********	NULL	*********	NULL	5.8	6	NULL	*********	7.1	9.0
005	11-May-2006	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	12-Jun-2006	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	10-Jul-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Aug-2006	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
005	11-Sep-2006	PH	NULL	*********	NULL	*********	NULL	6.5	6	NULL	*********	6.5	9.0
005	11-Oct-2006	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
005	13-Nov-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Dec-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Jan-2007	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
005	12-Feb-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	09-Mar-2007	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
005	10-Apr-2007	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
005	10-May-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Jun-2007	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	10-Jul-2007	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	13-Aug-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0

005	11-Sep-2007	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	11-Oct-2007	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	13-Nov-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Dec-2007	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
005	14-Jan-2008	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
005	11-Feb-2008	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
005	11-Mar-2008	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
005	11-Apr-2008	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	7.1	9.0
005	12-May-2008	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Jun-2008	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	11-Jul-2008	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Aug-2008	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
005	11-Sep-2008	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
005	14-Oct-2008	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	10-Nov-2008	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Dec-2008	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
005	12-Jan-2009	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	06-Feb-2009	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
005	11-Mar-2009	PH	NULL	*********	NULL	*********	NULL	6.4	6	NULL	*********	6.4	9.0
005	09-Apr-2009	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
005	11-May-2009	PH	NULL	*********	NULL	*********	NULL	6.6	6	NULL	*********	6.6	9.0
005	11-Jun-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	13-Jul-2009	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
005	07-Aug-2009	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	11-Sep-2009	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
005	08-Oct-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	12-Nov-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	11-Jan-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	08-Feb-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Mar-2010	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	09-Apr-2010	PH	NULL	*********	NULL	*********	NULL	6.7	6	NULL	*********	7.1	9.0
005	10-May-2010	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
005	10-Jun-2010	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	12-Jul-2010	PH	NULL	*********	NULL	*********	NULL	6.5	6	NULL	*********	6.5	9.0
005	11-Aug-2010	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	13-Sep-2010	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0

005	12-Oct-2010	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	12-Nov-2010	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
005	13-Dec-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Jan-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	10-Feb-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	14-Mar-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Apr-2011	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	11-May-2011	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
005	09-Jun-2011	PH	NULL	*********	NULL	*********	NULL	7.6	6	NULL	*********	7.6	9.0
005	11-Jul-2011	PH	NULL	*********	NULL	*********	NULL	6.7	6	NULL	*********	6.7	9.0
005	11-Aug-2011	PH	NULL	*********	NULL	*********	NULL	7.6	6	NULL	*********	7.6	9.0
005	09-Sep-2011	PH	NULL	*********	NULL	*********	NULL	7.6	6	NULL	*********	7.6	9.0
005	11-Oct-2011	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	14-Nov-2011	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
005	12-Dec-2011	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
005	10-Jan-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	10-Feb-2012	PH	NULL	*********	NULL	*********	NULL	6.7	6	NULL	*********	6.7	9.0
005	09-Mar-2012	PH	NULL	*********	NULL	*********	NULL	6.5	6	NULL	*********	6.5	9.0
005	10-Apr-2012	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	7	9.0
005	10-May-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Jun-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Jul-2012	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	13-Aug-2012	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
005	11-Sep-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
005	11-Oct-2012	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	13-Nov-2012	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
005	07-Dec-2012	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
005	11-Jan-2013	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
									90th percentile:			**7.5**	
									10th percentile:			**6.8**	
005	10-May-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.08	NL
005	10-Nov-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.1	NL
005	12-Jun-2006	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.02	NL
005	11-Mar-2008	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.19	NL
005	06-Feb-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.04	NL
005	06-Feb-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.04	NL
005	11-May-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.12	NL

005	08-Feb-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.08	NL
005	11-Aug-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.03	NL
005	10-Feb-2011	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.02	NL
005	14-Nov-2011	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.04	NL
005	10-Feb-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.03	NL
005	13-Aug-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.04	NL
005	10-May-2005	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.9	NL
005	10-Nov-2005	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1	NL
005	12-Jun-2006	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.2	NL
005	11-Mar-2008	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.001	NL
005	12-Jan-2009	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.2	NL
005	06-Feb-2009	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.1	NL
005	06-Feb-2009	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.1	NL
005	11-May-2009	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.1	NL
005	08-Feb-2010	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.1	NL
005	11-Aug-2010	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	10-Feb-2011	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	14-Nov-2011	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	10-Feb-2012	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
005	13-Aug-2012	SILVER, DISSOLVED (UG/L AS AG)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
005	07-Apr-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
005	10-May-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	62	NL
005	13-Jun-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
005	11-Jul-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	15	NL
005	05-Aug-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10	NL
005	12-Sep-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	42	NL
005	11-Oct-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	35	NL
005	10-Nov-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	12-Dec-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
005	11-Jan-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
005	10-Feb-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
005	13-Mar-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
005	11-Apr-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
005	11-May-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
005	12-Jun-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
005	10-Jul-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
005	11-Aug-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	15	NL

005	11-Sep-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
005	11-Oct-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
005	13-Nov-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
005	11-Dec-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	19	NL
005	11-Jan-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
005	12-Feb-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
005	09-Mar-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
005	10-Apr-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
005	10-May-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
005	11-Jun-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	10-Jul-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.1	NL
005	13-Aug-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL
005	11-Sep-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.9	NL
005	11-Oct-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.6	NL
005	13-Nov-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.9	NL
005	11-Dec-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	32	NL
005	14-Jan-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.6	NL
005	11-Feb-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
005	11-Mar-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	11-Apr-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
005	12-May-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	35	NL
005	11-Jun-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	11-Jul-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
005	11-Aug-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	11-Sep-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.7	NL
005	14-Oct-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
005	10-Nov-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
005	11-Dec-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
005	12-Jan-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.4	NL
005	06-Feb-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
005	11-Mar-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
005	09-Apr-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
005	11-May-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
005	11-Jun-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
005	13-Jul-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
005	07-Aug-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.3	NL
005	11-Sep-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5	NL

005	08-Oct-2009	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	19	NL
005	12-Nov-2009	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	8	NL
005	11-Dec-2009	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	20	NL
005	11-Jan-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12	NL
005	08-Feb-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	6	NL
005	11-Mar-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
005	09-Apr-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	21	NL
005	10-May-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	20	NL
005	10-Jun-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	9.5	NL
005	12-Jul-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	17	NL
005	11-Aug-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	15	NL
005	13-Sep-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	13	NL
005	12-Oct-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.8	NL
005	12-Nov-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	10	NL
005	13-Dec-2010	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	9.1	NL
005	11-Jan-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12	NL
005	10-Feb-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	22	NL
005	14-Mar-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
005	11-Apr-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
005	11-May-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	21	NL
005	09-Jun-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	17	NL
005	11-Jul-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	26	NL
005	11-Aug-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	7.7	NL
005	09-Sep-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	50	NL
005	11-Oct-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	19	NL
005	14-Nov-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	3.7	NL
005	12-Dec-2011	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12	NL
005	10-Jan-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	27	NL
005	10-Feb-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	15	NL
005	09-Mar-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	15	NL
005	10-Apr-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	19	NL
005	10-May-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
005	11-Jun-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	48	NL
005	11-Jul-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	38	NL
005	13-Aug-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	5.6	NL
005	11-Sep-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	10	NL
005	11-Oct-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12	NL

005	13-Nov-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	11	NL
005	07-Dec-2012	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	6.9	NL
005	11-Jan-2013	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	9.2	NL
005	07-Apr-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	158	NL
005	10-May-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	143	NL
005	13-Jun-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	73	NL
005	11-Jul-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	157	NL
005	05-Aug-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	70	NL
005	12-Sep-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	169	NL
005	11-Oct-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	32	NL
005	10-Nov-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
005	12-Dec-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	6	NL
005	11-Jan-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	197	NL
005	10-Feb-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	157	NL
005	13-Mar-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	179	NL
005	11-Apr-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	114	NL
005	11-May-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
005	12-Jun-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	8	NL
005	10-Jul-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	26	NL
005	11-Aug-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	20	NL
005	11-Sep-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	91	NL
005	11-Oct-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	43	NL
005	13-Nov-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	243	NL
005	11-Dec-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	176	NL
005	11-Jan-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	150	NL
005	12-Feb-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	222	NL
005	09-Mar-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	196	NL
005	10-Apr-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	206	NL
005	10-May-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	226	NL
005	11-Jun-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	482	NL
005	10-Jul-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	305	NL
005	13-Aug-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	190	NL
005	11-Sep-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	807	NL
005	11-Oct-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	256	NL
005	13-Nov-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	191	NL
005	11-Dec-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	120	NL
005	14-Jan-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	144	NL

005	11-Feb-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	160	NL
005	11-Mar-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	242	NL
005	11-Apr-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	947	NL
005	12-May-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	158	NL
005	11-Jun-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	322	NL
005	11-Jul-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	78	NL
005	11-Aug-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	156	NL
005	11-Sep-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	261	NL
005	14-Oct-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	264	NL
005	10-Nov-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	236	NL
005	11-Dec-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	298	NL
005	12-Jan-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	303	NL
005	06-Feb-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	262	NL
005	11-Mar-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	328	NL
005	09-Apr-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	137	NL
005	11-May-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	239	NL
005	11-Jun-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	178	NL
005	13-Jul-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	404	NL
005	07-Aug-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	201	NL
005	11-Sep-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	187	NL
005	08-Oct-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	660	NL
005	12-Nov-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	236	NL
005	11-Dec-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	430	NL
005	11-Jan-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	220	NL
005	08-Feb-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	193	NL
005	11-Mar-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	154	NL
005	09-Apr-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	181	NL
005	10-May-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	132	NL
005	10-Jun-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	202	NL
005	12-Jul-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	312	NL
005	11-Aug-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	422	NL
005	13-Sep-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	413	NL
005	12-Oct-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	104	NL
005	12-Nov-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	223	NL
005	13-Dec-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	260	NL
005	11-Jan-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	220	NL
005	10-Feb-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	336	NL

005	14-Mar-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	254	NL
005	11-Apr-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	179	NL
005	11-May-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	196	NL
005	09-Jun-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	107	NL
005	11-Jul-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	235	NL
005	11-Aug-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
005	09-Sep-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	109	NL
005	11-Oct-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	85	NL
005	14-Nov-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	203	NL
005	12-Dec-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	234	NL
005	10-Jan-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	185	NL
005	10-Feb-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	236	NL
005	09-Mar-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	192	NL
005	10-Apr-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	235	NL
005	10-May-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	170	NL
005	11-Jun-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	178	NL
005	11-Jul-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	217	NL
005	13-Aug-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	97	NL
005	11-Sep-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	62	NL
005	11-Oct-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	159	NL
005	13-Nov-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	200	NL
005	07-Dec-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	119	NL
005	11-Jan-2013	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	97	NL
006	07-Apr-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.8	NL
006	10-May-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.4	NL
006	13-Jun-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10.2	NL
006	11-Jul-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.1	NL
006	05-Aug-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14.5	NL
006	12-Sep-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13.6	NL
006	11-Oct-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.8	NL
006	10-Nov-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.8	NL
006	12-Dec-2005	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10.6	NL
006	11-Jan-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.21	NL
006	10-Feb-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.9	NL
006	13-Mar-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11.6	NL
006	11-Apr-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.97	NL
006	11-May-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.65	NL

006	12-Jun-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.15	NL
006	10-Jul-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.28	NL
006	11-Aug-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.5	NL
006	11-Sep-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.06	NL
006	11-Oct-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.21	NL
006	13-Nov-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.02	NL
006	11-Dec-2006	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.5	NL
006	11-Jan-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
006	12-Feb-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.83	NL
006	09-Mar-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.53	NL
006	10-Apr-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.55	NL
006	10-May-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.42	NL
006	11-Jun-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.05	NL
006	10-Jul-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.01	NL
006	13-Aug-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
006	11-Sep-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.63	NL
006	11-Oct-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.3	NL
006	13-Nov-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.5	NL
006	11-Dec-2007	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1.0	NL
006	14-Jan-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.03	NL
006	11-Feb-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.3	NL
006	11-Mar-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.85	NL
006	11-Apr-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10.1	NL
006	12-May-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.15	NL
006	11-Jun-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.32	NL
006	11-Jul-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.22	NL
006	11-Aug-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.52	NL
006	11-Sep-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.73	NL
006	14-Oct-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1.0	NL
006	10-Nov-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.51	NL
006	11-Dec-2008	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.65	NL
006	12-Jan-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.08	NL
006	06-Feb-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.85	NL
006	11-Mar-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.05	NL
006	09-Apr-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	11-May-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	11-Jun-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.1	NL

006	13-Jul-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.6	NL
006	10-Aug-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.3	NL
006	11-Sep-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.4	NL
006	08-Oct-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.4	NL
006	12-Nov-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.4	NL
006	11-Dec-2009	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.1	NL
006	11-Jan-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.8	NL
006	08-Feb-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.05	NL
006	11-Mar-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.2	NL
006	09-Apr-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.6	NL
006	10-May-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.8	NL
006	10-Jun-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4.9	NL
006	12-Jul-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.4	NL
006	11-Aug-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.6	NL
006	13-Sep-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.2	NL
006	12-Oct-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.6	NL
006	12-Nov-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
006	13-Dec-2010	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
006	11-Jan-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	10-Feb-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
006	14-Mar-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
006	11-Apr-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL
006	11-May-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
006	09-Jun-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9	NL
006	11-Jul-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	11-Aug-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	09-Sep-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
006	11-Oct-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	14-Nov-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	15	NL
006	12-Dec-2011	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
006	10-Jan-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	32	NL
006	10-Feb-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	09-Mar-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
006	10-Apr-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
006	10-May-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	11-Jun-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	11-Jul-2012	CARBON, TOTAL ORGANIC	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL

006	13-Aug-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
006	11-Sep-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<1	NL
006	11-Oct-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	3.6	NL
006	13-Nov-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	3.1	NL
006	07-Dec-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12.9	NL
006	11-Jan-2013	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.8	NL
006	07-Apr-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	25	NL
006	10-May-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	24	NL
006	13-Jun-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
006	11-Jul-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
006	05-Aug-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	22	NL
006	12-Sep-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
006	11-Oct-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<50	NL
006	10-Nov-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<10	NL
006	12-Dec-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<50	NL
006	11-Jan-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	50	NL
006	10-Feb-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	32	NL
006	13-Mar-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	20	NL
006	11-Apr-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	62	NL
006	11-May-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	68	NL
006	12-Jun-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	56	NL
006	10-Jul-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	22	NL
006	11-Aug-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	60	NL
006	11-Sep-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	63	NL
006	11-Oct-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	22	NL
006	13-Nov-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	54	NL
006	11-Dec-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	46	NL
006	11-Jan-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	50	NL
006	12-Feb-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	30	NL
006	09-Mar-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	57	NL
006	10-Apr-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	49	NL
006	10-May-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	42	NL
006	11-Jun-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	37	NL
006	10-Jul-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	26	NL
006	13-Aug-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	27	NL
006	11-Sep-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<10	NL
006	11-Oct-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	57	NL

006	13-Nov-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	79	NL
006	11-Dec-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	14-Jan-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
006	11-Feb-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
006	11-Mar-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
006	11-Apr-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
006	12-May-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	44	NL
006	11-Jun-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	38	NL
006	11-Jul-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL
006	11-Aug-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-Sep-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
006	14-Oct-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
006	10-Nov-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	11-Dec-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	12-Jan-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27	NL
006	06-Feb-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	11-Mar-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	61	NL
006	09-Apr-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	35	NL
006	11-May-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
006	11-Jun-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL
006	13-Jul-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	10-Aug-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
006	11-Sep-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
006	08-Oct-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	12-Nov-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	11-Dec-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	11-Jan-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<10	NL
006	08-Feb-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
006	11-Mar-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<10	NL
006	09-Apr-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	10-May-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
006	10-Jun-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
006	12-Jul-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
006	11-Aug-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
006	13-Sep-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
006	12-Oct-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
006	12-Nov-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	38	NL

006	13-Dec-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	11-Jan-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	10-Feb-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27	NL
006	14-Mar-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	19	NL
006	11-Apr-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
006	11-May-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
006	09-Jun-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	35	NL
006	11-Jul-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
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006	10-Apr-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	44	NL
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006	11-Jul-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
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006	11-Sep-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL
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006	07-Dec-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	56	NL
006	11-Jan-2013	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
006	10-May-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	184	NL
006	10-Nov-2005	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	219	NL
006	12-Jun-2006	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	172	NL
006	11-Mar-2008	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	35	NL
006	12-Jan-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	233	NL
006	06-Feb-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	287	NL
006	06-Feb-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	287	NL
006	11-May-2009	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	215	NL
006	08-Feb-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	262	NL
006	10-Feb-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	263	NL
006	11-Aug-2010	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	250	NL

006	14-Nov-2011	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	167	NL
006	10-Feb-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	230	NL
006	13-Aug-2012	HARDNESS, TOTAL (AS CACO3)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	282	NL
									Average:			220.4	
006	10-May-2005	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9	NL
006	10-Nov-2005	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	12-Jun-2006	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5	NL
006	13-Nov-2007	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	11-Mar-2008	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	12-Jan-2009	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	06-Feb-2009	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	06-Feb-2009	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	11-May-2009	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
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006	10-Feb-2010	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	14	NL
006	11-Aug-2010	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	14-Nov-2011	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
006	10-Feb-2012	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9	NL
006	13-Aug-2012	NICKEL, DISSOLVED (UG/L AS NI)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7	NL
006	07-Apr-2005	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	10-May-2005	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
006	13-Jun-2005	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
006	11-Jul-2005	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	05-Aug-2005	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	12-Sep-2005	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Oct-2005	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	10-Nov-2005	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	12-Dec-2005	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Jan-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
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006	10-Jul-2006	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Aug-2006	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
006	11-Sep-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0

006	11-Oct-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	13-Nov-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Dec-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Jan-2007	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	12-Feb-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	09-Mar-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-Apr-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-May-2007	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Jun-2007	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	10-Jul-2007	PH	NULL	*********	NULL	*********	NULL	6.6	6	NULL	*********	6.6	9.0
006	13-Aug-2007	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
006	11-Sep-2007	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
006	11-Oct-2007	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	13-Nov-2007	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
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006	14-Jan-2008	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	11-Feb-2008	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Mar-2008	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
006	11-Apr-2008	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
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006	11-Jul-2008	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Aug-2008	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Sep-2008	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	14-Oct-2008	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	10-Nov-2008	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	11-Dec-2008	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	12-Jan-2009	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	06-Feb-2009	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
006	11-Mar-2009	PH	NULL	*********	NULL	*********	NULL	6.5	6	NULL	*********	6.5	9.0
006	09-Apr-2009	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
006	11-May-2009	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
006	11-Jun-2009	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	13-Jul-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-Aug-2009	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	11-Sep-2009	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	08-Oct-2009	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0

006	12-Nov-2009	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Jan-2010	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	08-Feb-2010	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	11-Mar-2010	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
006	09-Apr-2010	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7.2	9.0
006	10-May-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-Jun-2010	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	12-Jul-2010	PH	NULL	*********	NULL	*********	NULL	6.7	6	NULL	*********	6.7	9.0
006	11-Aug-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	13-Sep-2010	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	12-Oct-2010	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	12-Nov-2010	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	13-Dec-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Jan-2011	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	10-Feb-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	14-Mar-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Apr-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-May-2011	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	09-Jun-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Jul-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Aug-2011	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
006	09-Sep-2011	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	11-Oct-2011	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	14-Nov-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	12-Dec-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-Jan-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-Feb-2012	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
006	09-Mar-2012	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	10-Apr-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	10-May-2012	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	11-Jun-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
006	11-Jul-2012	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
006	13-Aug-2012	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0
006	11-Sep-2012	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
006	11-Oct-2012	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
006	13-Nov-2012	PH	NULL	*********	NULL	*********	NULL	7.5	6	NULL	*********	7.5	9.0

006	07-Dec-2012	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
006	11-Jan-2013	PH	NULL	*********	NULL	*********	NULL	7.4	6	NULL	*********	7.4	9.0
									90th percentile:			7.4	
									90th percentile:			7	
006	10-May-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.14	NL
006	10-Nov-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.22	NL
006	12-Jun-2006	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.17	NL
006	11-Mar-2008	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.12	NL
006	12-Jan-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.13	NL
006	06-Feb-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.14	NL
006	06-Feb-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.14	NL
006	11-May-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.16	NL
006	08-Feb-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3.3	NL
006	10-Feb-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.08	NL
006	11-Aug-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.21	NL
006	14-Nov-2011	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.2	NL
006	10-Feb-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.1	NL
006	13-Aug-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.19	NL
006	07-Apr-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	10-May-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	13-Jun-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
006	11-Jul-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	68	NL
006	05-Aug-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
006	12-Sep-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
006	11-Oct-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
006	10-Nov-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	19	NL
006	12-Dec-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9	NL
006	11-Jan-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8	NL
006	10-Feb-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
006	13-Mar-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
006	11-Apr-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	19	NL
006	11-May-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	74	NL
006	12-Jun-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	50	NL
006	10-Jul-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
006	11-Aug-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	40	NL
006	11-Sep-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	11-Oct-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	149	NL

006	13-Nov-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-Dec-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-Jan-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
006	12-Feb-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	09-Mar-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	10-Apr-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
006	10-May-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	43	NL
006	11-Jun-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	112	NL
006	10-Jul-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	76	NL
006	13-Aug-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
006	11-Sep-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	108	NL
006	11-Oct-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	13-Nov-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-Dec-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	14-Jan-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.6	NL
006	11-Feb-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.4	NL
006	11-Mar-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	11-Apr-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	12-May-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
006	11-Jun-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-Jul-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-Aug-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	11-Sep-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
006	14-Oct-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	16	NL
006	10-Nov-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	62	NL
006	11-Dec-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.5	NL
006	12-Jan-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5.6	NL
006	06-Feb-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	11-Mar-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	09-Apr-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
006	11-May-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	11-Jun-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
006	13-Jul-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.2	NL
006	10-Aug-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27	NL
006	11-Sep-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
006	08-Oct-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.2	NL
006	12-Nov-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9.3	NL

006	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.9	NL
006	11-Jan-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
006	08-Feb-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.4	NL
006	11-Mar-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	09-Apr-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	10-May-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	17	NL
006	10-Jun-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
006	12-Jul-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	18	NL
006	11-Aug-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
006	13-Sep-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
006	12-Oct-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	12-Nov-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	45	NL
006	13-Dec-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
006	11-Jan-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
006	10-Feb-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9	NL
006	14-Mar-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10	NL
006	11-Apr-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	11-May-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
006	09-Jun-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
006	11-Jul-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	48	NL
006	11-Aug-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	09-Sep-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	40	NL
006	11-Oct-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
006	14-Nov-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL
006	12-Dec-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL
006	10-Jan-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
006	10-Feb-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
006	09-Mar-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	19	NL
006	10-Apr-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	42	NL
006	10-May-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
006	11-Jun-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	13	NL
006	11-Jul-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	51	NL
006	13-Aug-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	68	NL
006	11-Sep-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	39	NL
006	11-Oct-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
006	13-Nov-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
006	07-Dec-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL

006	11-Jan-2013	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	15	NL
006	10-May-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	17	NL
006	10-Nov-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
006	12-Jun-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
006	13-Nov-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
006	11-Mar-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	40	NL
006	12-Jan-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	24	NL
006	06-Feb-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
006	06-Feb-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
006	11-May-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL
006	08-Feb-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	25	NL
006	10-Feb-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	52	NL
006	11-Aug-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	9	NL
006	14-Nov-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	15	NL
006	10-Feb-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	26	NL
006	13-Aug-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	9	NL
601	13-Jun-2005	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	12	NL
601	12-Dec-2005	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	7.2	NL
601	10-Jul-2006	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	5.66	NL
601	11-Dec-2007	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	4.98	NL
601	11-Jun-2008	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.53	NL
601	11-May-2009	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	4.6	NL
601	11-Dec-2009	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	3.5	NL
601	11-Dec-2009	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	3.5	NL
601	10-Jun-2010	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	9.4	NL
601	12-Nov-2010	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	4.8	NL
601	09-Jun-2011	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	19	NL
601	10-Feb-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	6	NL
601	11-Oct-2012	CARBON, TOTAL ORGANIC	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	5.3	NL
601	13-Jun-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	23	NL
601	12-Dec-2005	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	131	NL
601	10-Jul-2006	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	47	NL
601	11-Dec-2007	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	14	NL
601	11-Jun-2008	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	54	NL
601	11-May-2009	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	52	NL
601	11-Dec-2009	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	18	NL
601	11-Dec-2009	COD	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	16	NL

601	10-Jun-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	58	NL
601	12-Nov-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
601	09-Jun-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	79	NL
601	10-Feb-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	45	NL
601	11-Oct-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
601	13-Jun-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	15	NL
601	12-Dec-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
601	10-Jul-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7	NL
601	11-Dec-2007	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
601	11-Jun-2008	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
601	11-May-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
601	11-Dec-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
601	11-Dec-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
601	10-Jun-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
601	12-Nov-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	9	NL
601	09-Jun-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
601	10-Feb-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6	NL
601	11-Oct-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
601	13-Jun-2005	PH	NULL	*********	NULL	*********	NULL	7	NL	NULL	*********	7	NL
601	12-Dec-2005	PH	NULL	*********	NULL	*********	NULL	7	NL	NULL	*********	7	NL
601	10-Jul-2006	PH	NULL	*********	NULL	*********	NULL	7	NL	NULL	*********	7	NL
601	11-Dec-2007	PH	NULL	*********	NULL	*********	NULL	6.8	NL	NULL	*********	6.8	NL
601	11-Jun-2008	PH	NULL	*********	NULL	*********	NULL	6.8	NL	NULL	*********	6.8	NL
601	11-May-2009	PH	NULL	*********	NULL	*********	NULL	6.8	NL	NULL	*********	6.8	NL
601	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	6.9	NL	NULL	*********	6.9	NL
601	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	6.9	NL	NULL	*********	6.9	NL
601	10-Jun-2010	PH	NULL	*********	NULL	*********	NULL	6.8	NL	NULL	*********	6.8	NL
601	12-Nov-2010	PH	NULL	*********	NULL	*********	NULL	7.6	NL	NULL	*********	7.6	NL
601	09-Jun-2011	PH	NULL	*********	NULL	*********	NULL	7.1	NL	NULL	*********	7.1	NL
601	10-Feb-2012	PH	NULL	*********	NULL	*********	NULL	7	NL	NULL	*********	7	NL
601	11-Oct-2012	PH	NULL	*********	NULL	*********	NULL	6.9	NL	NULL	*********	6.9	NL
									90th percentile:			**7.1**	
									10th percentile:			**6.8**	
601	13-Jun-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.7	NL
601	12-Dec-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.61	NL
601	10-Jul-2006	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.35	NL
601	11-Dec-2007	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.28	NL

601	11-Jun-2008	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.16	NL
601	11-May-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.21	NL
601	11-Dec-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.12	NL
601	11-Dec-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.12	NL
601	10-Jun-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.39	NL
601	12-Nov-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.34	NL
601	09-Jun-2011	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	44	NL
601	10-Feb-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.21	NL
601	11-Oct-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.38	NL
601	13-Jun-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	192	NL
601	12-Dec-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	62	NL
601	10-Jul-2006	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	275	NL
601	11-Dec-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	23	NL
601	11-Jun-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	7.9	NL
601	11-May-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
601	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.9	NL
601	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	6.9	NL
601	10-Jun-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	182	NL
601	12-Nov-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	103	NL
601	09-Jun-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	165	NL
601	10-Feb-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	75	NL
601	11-Oct-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
601	13-Jun-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	122	NL
601	12-Dec-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	46	NL
601	10-Jul-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	77	NL
601	11-Dec-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	71	NL
601	11-Jun-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL
601	11-May-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	59	NL
601	11-Dec-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	83	NL
601	11-Dec-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	83	NL
601	10-Jun-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	99	NL
601	12-Nov-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
601	09-Jun-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	49	NL
601	10-Feb-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	30	NL
601	11-Oct-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	21	NL
905	10-May-2005	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	NR	NL
905	13-Jun-2005	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	36	NL

905	12-Dec-2005	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	81	NL
905	10-Jul-2006	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	91	NL
905	10-Dec-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	54	NL
905	11-Dec-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	54	NL
905	11-Jun-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	58	NL
905	11-Dec-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
905	11-Dec-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
905	10-Jun-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	66	NL
905	12-Nov-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
905	09-Jun-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	58	NL
905	10-Feb-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	37	NL
905	11-Oct-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
905	13-Jun-2005	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
905	12-Dec-2005	PH	NULL	*********	NULL	*********	NULL	7.3	6	NULL	*********	7.3	9.0
905	10-Jul-2006	PH	NULL	*********	NULL	*********	NULL	6.1	6	NULL	*********	6.1	9.0
905	10-Dec-2007	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
905	11-Jun-2008	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
905	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
905	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
905	10-Jun-2010	PH	NULL	*********	NULL	*********	NULL	6.8	6	NULL	*********	6.8	9.0
905	12-Nov-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
905	12-Nov-2010	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
905	09-Jun-2011	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
905	10-Feb-2012	PH	NULL	*********	NULL	*********	NULL	6.9	6	NULL	*********	6.9	9.0
905	11-Oct-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
									90th percentile:			7.2	
									10th percentile:			6.8	
905	13-Jun-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.2	NL
905	12-Dec-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.58	NL
905	10-Jul-2006	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.34	NL
905	10-Dec-2007	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.32	NL
905	11-Dec-2007	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.32	NL
905	11-Jun-2008	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.12	NL
905	11-Dec-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.22	NL
905	11-Dec-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.22	NL
905	10-Jun-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.32	NL
905	12-Nov-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.18	NL

905	12-Nov-2010	PHOSPHORUS, TOTAL (AS P)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	0.18	NL
905	09-Jun-2011	PHOSPHORUS, TOTAL (AS P)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	0.39	NL
905	10-Feb-2012	PHOSPHORUS, TOTAL (AS P)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.4	NL
905	11-Oct-2012	PHOSPHORUS, TOTAL (AS P)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	0.16	NL
905	13-Jun-2005	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	12-Dec-2005	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	10-Jul-2006	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	10-Dec-2007	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<QL	NL
905	11-Dec-2007	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	X	NL
905	11-Jun-2008	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	11-Dec-2009	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	11-Dec-2009	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	10-Jun-2010	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	12-Nov-2010	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	12-Nov-2010	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	09-Jun-2011	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	10-Feb-2012	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	11-Oct-2012	PROPYLENE OXIDE	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	<5	NL
905	13-Jun-2005	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.5	NL
905	12-Dec-2005	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	1.7	NL
905	10-Jul-2006	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	1.5	NL
905	10-Dec-2007	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	1.7	NL
905	11-Dec-2007	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	1.7	NL
905	11-Jun-2008	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	1.1	NL
905	11-Dec-2009	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	4.5	NL
905	11-Dec-2009	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	4.5	NL
905	10-Jun-2010	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2.6	NL
905	12-Nov-2010	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	0.8	NL
905	12-Nov-2010	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	0.8	NL
905	09-Jun-2011	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	2	NL
905	10-Feb-2012	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	5	NL
905	11-Oct-2012	TKN (N-KJEL)	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	0.7	NL
905	13-Jun-2005	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	501	NL
905	12-Dec-2005	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	40	NL
905	10-Jul-2006	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	38	NL
905	10-Dec-2007	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	115	NL
905	11-Dec-2007	TSS	NULL	**********	NULL	**********	NULL	NULL	**********	NULL	**********	115	NL

905	11-Jun-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	24	NL
905	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	60	NL
905	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	60	NL
905	10-Jun-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	138	NL
905	12-Nov-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
905	12-Nov-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
905	09-Jun-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	260	NL
905	10-Feb-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	51	NL
905	11-Oct-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	26	NL
905	10-May-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	297	NL
905	13-Jun-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	28	NL
905	12-Sep-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	150	NL
905	12-Dec-2005	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	150	NL
905	11-Apr-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	49	NL
905	10-Jul-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	205	NL
905	11-Sep-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	724	NL
905	11-Dec-2006	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	51	NL
905	11-Jun-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	61	NL
905	11-Dec-2007	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	198	NL
905	11-Mar-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	398	NL
905	11-Jun-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	92	NL
905	14-Oct-2008	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	92	NL
905	11-Dec-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	302	NL
905	11-Dec-2009	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	302	NL
905	11-Mar-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	349	NL
905	10-Jun-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	131	NL
905	13-Sep-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	75	NL
905	12-Nov-2010	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	110	NL
905	11-Jan-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	110	NL
905	11-Apr-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	125	NL
905	09-Jun-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	34	NL
905	09-Sep-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	123	NL
905	14-Nov-2011	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	78	NL
905	10-Feb-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	46	NL
905	11-Jun-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	173	NL
905	11-Oct-2012	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	68	NL
905	11-Jan-2013	ZINC, DISSOLVED (AS ZN) (UG/L)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	266	NL

906	13-Jun-2005	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	12	NL
906	12-Dec-2005	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	116	NL
906	10-Jul-2006	COD	NULL	*********	NULL	*********	NULL	57	*********	76	*********	96	NL
906	10-Dec-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
906	11-Dec-2007	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	29	NL
906	11-Jun-2008	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
906	11-Dec-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
906	11-Dec-2009	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	22	NL
906	10-Jun-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	51	NL
906	12-Nov-2010	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	32	NL
906	09-Jun-2011	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	48	NL
906	10-Feb-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
906	11-Oct-2012	COD	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	25	NL
906	10-May-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
906	13-Jun-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
906	12-Sep-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	12-Dec-2005	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
906	11-Apr-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	10-Jul-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	<QL	*********	<QL	*********	<QL	NL
906	11-Sep-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	11-Dec-2006	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	20	NL
906	11-Jun-2007	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	52	NL
906	11-Dec-2007	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	11-Mar-2008	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<0.001	NL
906	11-Jun-2008	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
906	14-Oct-2008	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	5	NL
906	11-Dec-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
906	11-Dec-2009	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
906	11-Mar-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	10-Jun-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	4	NL
906	13-Sep-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	12-Nov-2010	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	41	NL
906	11-Apr-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	09-Jun-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	10	NL
906	09-Sep-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
906	14-Nov-2011	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
906	10-Feb-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL

906	11-Jun-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	2	NL
906	11-Oct-2012	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	3	NL
906	11-Jan-2013	COPPER, DISSOLVED (UG/L AS CU)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<1	NL
906	13-Jun-2005	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
906	12-Dec-2005	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
906	10-Jul-2006	PH	NULL	*********	NULL	*********	NULL	7.2	6	7.2	*********	7.3	9.0
906	10-Dec-2007	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
906	11-Dec-2007	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
906	11-Jun-2008	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
906	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
906	11-Dec-2009	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
906	10-Jun-2010	PH	NULL	*********	NULL	*********	NULL	7	6	NULL	*********	7	9.0
906	12-Nov-2010	PH	NULL	*********	NULL	*********	NULL	7.1	6	NULL	*********	7.1	9.0
906	09-Jun-2011	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
906	10-Feb-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
906	11-Oct-2012	PH	NULL	*********	NULL	*********	NULL	7.2	6	NULL	*********	7.2	9.0
									90th percentile:			7.2	
									10th percentile:			7.1	
906	13-Jun-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.26	NL
906	12-Dec-2005	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.15	NL
906	10-Jul-2006	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	0.4	*********	0.61	*********	0.82	NL
906	10-Dec-2007	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.15	NL
906	11-Dec-2007	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.15	NL
906	11-Jun-2008	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.16	NL
906	11-Dec-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.07	NL
906	11-Dec-2009	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.07	NL
906	10-Jun-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.65	NL
906	12-Nov-2010	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.36	NL
906	09-Jun-2011	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.28	NL
906	10-Feb-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.45	NL
906	11-Oct-2012	PHOSPHORUS, TOTAL (AS P)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.26	NL
906	13-Jun-2005	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	12-Dec-2005	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	10-Jul-2006	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	10-Dec-2007	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<QL	NL
906	11-Dec-2007	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	X	NL
906	11-Jun-2008	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL

906	11-Dec-2009	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	11-Dec-2009	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	10-Jun-2010	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	12-Nov-2010	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	09-Jun-2011	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	10-Feb-2012	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	11-Oct-2012	PROPYLENE OXIDE	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	<5	NL
906	13-Jun-2005	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1	NL
906	12-Dec-2005	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.8	NL
906	10-Jul-2006	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.7	NL
906	10-Dec-2007	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.6	NL
906	11-Dec-2007	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.6	NL
906	11-Jun-2008	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1	NL
906	11-Dec-2009	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27	NL
906	11-Dec-2009	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	27	NL
906	10-Jun-2010	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.8	NL
906	12-Nov-2010	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	0.8	NL
906	09-Jun-2011	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.1	NL
906	10-Feb-2012	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.4	NL
906	11-Oct-2012	TKN (N-KJEL)	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	1.3	NL
906	13-Jun-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	113	NL
906	12-Dec-2005	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	33	NL
906	10-Jul-2006	TSS	NULL	*********	NULL	*********	NULL	115	*********	340	*********	565	NL
906	10-Dec-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
906	11-Dec-2007	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	11	NL
906	11-Jun-2008	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	38	NL
906	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.9	NL
906	11-Dec-2009	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	8.9	NL
906	10-Jun-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	242	NL
906	12-Nov-2010	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	127	NL
906	09-Jun-2011	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	212	NL
906	10-Feb-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	253	NL
906	11-Oct-2012	TSS	NULL	*********	NULL	*********	NULL	NULL	*********	NULL	*********	102	NL

Mixing Zone Predictions for Hercules Aqualon 005

Low Flow

Effluent Flow = 0.012 MGD
Stream 7Q10 = 1.2 MGD
Stream 30Q10 = 1.7 MGD
Stream 1Q10 = 1.1 MGD
Stream slope = 0.00071 ft/ft
Stream width = 36 ft
Bottom scale = 1
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .196 ft
Length = 10512.24 ft
Velocity = .266 ft/sec
Residence Time = .4575 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .2413 ft
Length = 8823.08 ft
Velocity = .3051 ft/sec
Residence Time = .3348 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .186 ft
Length = 10981.32 ft
Velocity = .257 ft/sec
Residence Time = 11.8686 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 8.43% of the 1Q10 is used.

Mixing Zone Predictions for Hercules Aqualon 005

High Flow

Effluent Flow = 0.132 MGD
Stream 7Q10 = 4.2 MGD
Stream 30Q10 = 5.0 MGD
Stream 1Q10 = 4.0 MGD
Stream slope = 0.00071 ft/ft
Stream width = 36 ft
Bottom scale = 1
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .4229 ft
Length = 5491.87 ft
Velocity = .4405 ft/sec
Residence Time = .1443 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .4686 ft
Length = 5033.28 ft
Velocity = .4709 ft/sec
Residence Time = .1237 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .4109 ft
Length = 5626.97 ft
Velocity = .4324 ft/sec
Residence Time = 3.6152 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 27.66% of the 1Q10 is used.

Mixing Zone Predictions for Hercules Aqualon 006

Effluent Flow = 0.053 MGD
Stream 7Q10 = 1.2 MGD
Stream 30Q10 = 1.7 MGD
Stream 1Q10 = 1.1 MGD
Stream slope = 0.00071 ft/ft
Stream width = 36 ft
Bottom scale = 1
Channel scale = 1

low Flow

Mixing Zone Predictions @ 7Q10

Depth = .1999 ft
Length = 10336.5 ft
Velocity = .2695 ft/sec
Residence Time = .4439 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .2448 ft
Length = 8719.4 ft
Velocity = .3079 ft/sec
Residence Time = .3277 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .1901 ft
Length = 10781.93 ft
Velocity = .2607 ft/sec
Residence Time = 11.4866 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 8.71% of the 1Q10 is used.

Mixing Zone Predictions for Hercules Aqualon 006

High Flow

Effluent Flow = 0.178 MGD
Stream 7Q10 = 4.2 MGD
Stream 30Q10 = 5.0 MGD
Stream 1Q10 = 4.0 MGD
Stream slope = 0.00071 ft/ft
Stream width = 36 ft
Bottom scale = 1
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .4256 ft
Length = 5462.12 ft
Velocity = .4423 ft/sec
Residence Time = .1429 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .4711 ft
Length = 5010.05 ft
Velocity = .4726 ft/sec
Residence Time = .1227 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .4137 ft
Length = 5595.26 ft
Velocity = .4342 ft/sec
Residence Time = 3.5792 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 27.94% of the 1Q10 is used.

6/25/2013 11:05:12 AM

Facility = Hercules Aqualon 005
Chemical = Copper
Chronic averaging period = 4
WLAa = 30
WLAc = 64
Q.L. = 12
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 14
Expected Value =
Variance =
C.V. =
97th percentile daily values =
97th percentile 4 day average =
97th percentile 30 day average=
< Q.L. = 14
Model used =

No Limit is required for this material

The data are:

7
1
1
6
6
10
10
8
4
2
2
3
5
1

6/25/2013 11:03:12 AM

Facility = Hercules Aqualon 005
Chemical = Silver
Chronic averaging period = 4
WLAa = 9.7
WLAc =
Q.L. = 3.9
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 14
Expected Value =
Variance =
C.V. =
97th percentile daily values =
97th percentile 4 day average =
97th percentile 30 day average=
< Q.L. = 14
Model used =

No Limit is required for this material

The data are:

0.9
1
0
0
0.2
0
0
0
0
1
1
1
3
1

6/25/2013 11:10:12 AM

Facility = Hercules Aqualon 005
Chemical = Zinc
Chronic averaging period = 4
WLAa = 260
WLAc = 850
Q.L. = 100
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 94
Expected Value = 212.772
Variance = 11911.1
C.V. = 0.512932
97th percentile daily values = 456.297
97th percentile 4 day average = 320.547
97th percentile 30 day average= 247.662
< Q.L. = 17
Model used = delta lognormal

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 260
Average Weekly limit = 260
Average Monthly LImit = 260

The data are:

158
143
73
157
70
169
32
0
6
197
157
179
114
18
8
26
20
91
43
243

150
222
196
206
226
482
305
190
807
256
191
120
144
160
242
947
158
322
78
156
261
264
236
298
303
262
328
137
239
178
404
201
187
660
236
430
220
193
154
181
132
202
312
422
413
104
223
260
220
336
254
179
196
107
235
24

85
203
234
185
236
192
235
170
178
217
97
62
159
200
119
97

6/25/2013 11:16:03 AM

Facility = Hercules Aqualon 006
Chemical = Nickel
Chronic averaging period = 4
WLAa = 420
WLAc = 120
Q.L. = 73
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 14
Expected Value =
Variance =
C.V. =
97th percentile daily values =
97th percentile 4 day average = 320.547
97th percentile 30 day average= 247.662
< Q.L. = 14
Model used =

No Limit is required for this material

The data are:

9
0
5
0
0
8
0
7
0
14
0
0
9
7

6/25/2013 11:19:55 AM

Facility = Hercules Aqualon 006
Chemical = Zinc
Chronic averaging period = 4
WLAa = 270
WLAc = 710
Q.L. = 110
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 15
Expected Value =
Variance =
C.V. =
97th percentile daily values =
97th percentile 4 day average = 320.547
97th percentile 30 day average= 247.662
< Q.L. = 15
Model used =

No Limit is required for this material

The data are:

17
0
16
14
40
24
16
16
16
25
52
9
15
26
9

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Northern Regional Office
13901 Crown Court **Woodbridge, VA 22193** **(703) 583-3800**

SUBJECT: TOXICS MANAGEMENT PROGRAM (TMP) DATA REVIEW
Hercules Incorporated, Aqualon Division (VA0003492)
REVIEWER: Douglas Frasier
DATE: 24 October 2013

DATA REVIEWED:

This review covers acute toxicity tests conducted from 2010 to 2013 at Outfall 005/905 and Outfall 006/906.

DISCUSSION:

The acute toxicity of the effluent samples was determined with the 48-hour static acute toxicity test using *C. dubia* as the test species.

The chronic toxicity of the effluent samples was determined with a 3-brood static daily renewal survival and reproduction chronic toxicity test using *C. dubia* as the test species.

The acute toxicity test monitoring endpoint is a No Observed Adverse Effect Concentration (NOAEC) of 100% effluent while the chronic toxicity test monitoring endpoint is a No Observed Effect Concentration of 29% effluent and 30% effluent at Outfall 005 and Outfall 006, respectively.

CONCLUSION:

The chronic and acute toxicity tests are valid and the results are acceptable. The test results indicate that the effluent samples from Outfall 005/905 and Outfall 006/906 exhibit no acute or chronic toxicity to the test species *C. dubia*.

BIOMONITORING RESULTS
Hercules Incorporated, Aqualon Division (VA0003492)

Table 1
Summary of Toxicity Test Results for Outfall 005

TEST DATE	TEST TYPE/ORGANISM	48-hr LC_{50} (%)	NOAEC (%)	SURV (%)	REMARKS
04/07/10	Acute *C. dubia*	>100	100	100	TU_a of 1.00
10/14/10	Acute *C. dubia*	>100	100	100	TU_a of 1.00
02/16/11	Acute *C. dubia*	>100	100	100	TU_a of 1.00
06/10/11	Acute *C. dubia*	>100	100	80	TU_a of 1.00
08/25/11	Acute *C. dubia*	>100	100	100	TU_a of 1.00
07/18/12	Acute *C. dubia*	>100	100	100	TU_a of 1.00
10/12/12	Acute *C. dubia*	>100	100	90	TU_a of 1.00
04/03/12	Acute *C. dubia*	>100	100	100	TU_a of 1.00
08/23/13	Acute *C. dubia*	>100	100	100	TU_a of 1.00

Table 2
Summary of Toxicity Test Results for Outfall 905

TEST DATE	TEST TYPE/ORGANISM	48-hr LC_{50} (%)	NOAEC (%)	SURV (%)	REMARKS
10/15/10	Acute *C. dubia*	>100	100	100	TU_a of 1.00
10/13/11	Acute *C. dubia*	>100	100	95	TU_a of 1.00
01/27/12	Acute *C. dubia*	>100	100	100	TU_a of 1.00

Table 3
Summary of Toxicity Test Results for Outfall 006

TEST DATE	TEST TYPE/ORGANISM	48-hr LC_{50} (%)	NOAEC (%)	SURV (%)	REMARKS
10/14/10	Acute *C. dubia*	>100	100	100	TU_a of 1.00
02/16/11	Acute *C. dubia*	>100	100	95	TU_a of 1.00

TEST DATE	TEST TYPE/ORGANISM	48-hr LC_{50} (%)	IC_{25} (%)	NOEC (%)	SURV (%)	REMARKS
10/19/11	Chronic *C. dubia*	>100	>100	100 SR	100	TU_c of 1.00
03/19/13	Chronic *C. dubia*	>100	>100	100 SR	100	TU_c of 1.00

Table 4
Summary of Toxicity Test Results for Outfall 906

TEST DATE	TEST TYPE/ORGANISM	48-hr LC_{50} (%)	NOAEC (%)	SURV (%)	REMARKS
10/15/10	Acute *C. dubia*	>100	100	100	TU_a of 1.00
10/13/11	Acute *C. dubia*	>100	100	95	TU_a of 1.00
01/27/12	Acute *C. dubia*	>100	100	100	TU_a of 1.00

ABBREVIATIONS:
S – Survival; R – Reproduction; G – Growth
% SURV – Percent survival in 100% effluent
INV – Invalid

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of cooling water, groundwater, steam condensate and stormwater into a water body in Hopewell City, Virginia.

PUBLIC COMMENT PERIOD: TBD, 2013 to TBD, 2013

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Hercules Incorporated Aqualon Division
1111 Hercules Road, Hopewell, VA 23860
VA0003492

PROJECT DESCRIPTION: Hercules Incorporated Aqualon Division has applied for a reissuance of a permit for the private Hercules Incorporated Aqualon Division. The applicant proposes to release cooling water, groundwater, steam condensate and stormwater at a rate of 0.310 million gallons per day into a water body. There is no sludge generated. The facility proposes to release the release cooling water, groundwater, steam condensate and stormwater in the Bailey Creek in Hopewell City in the James River watershed. A watershed is the land area drained by a river and its incoming streams. The permit requires monitoring the following pollutants to protect water quality: pH, dissolved oxygen, total suspended solids, total organic carbon, total hardness, dissolved zinc, total phosphorus and total nitrogen.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Douglas Frasier
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: 703-583-3873 E-mail: Douglas.Frasier@deq.virginia.gov Fax: 703-583-3821

Douglas W. Domenech
Secretary of Natural Resources

David A. Johnson
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

600 East Main Street, 24th Floor
Richmond, Virginia 23219
(804) 786-6124

November 22, 2013

Susan Mackert
DEQ-NRO
13901 Crown Court
Woodbridge, VA 20112

Re: VA0003462, Hercules Inc. – Aqualon Division Outfalls 013 and 601

Dear Ms. Mackert:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, the Atlantic sturgeon (*Acipenser oxyrinchus,* G3/S2/LE/LT) has been documented downstream from the project site in the James River. Atlantic sturgeon is a large fish that reaches a maximum length of about 4.3 meters and may live for several decades. The adults migrate between fresh water spawning areas and salt water non-spawning areas. They feed primarily on benthic invertebrates and small fishes as available.

Stocks on the Atlantic slope have been severely reduced by overfishing (mainly late 1800s and early 1900s), pollution, sedimentation, and blockage of access to spawning areas by dams (Gilbert 1989, Burkhead and Jenkins 1991, Marine and Coastal Species Information System 1996). In Chesapeake Bay and elsewhere in the range, hypoxic events have increased and may degrade nursery habitat for Atlantic sturgeon (Secor and Gunderson 1997). Habitat loss due to dam construction and water pollution are thought to be major factors impeding full recovery of populations (Smith 1985, cited by Johnson et al. 1997; Gilbert 1989). A late maturation age and use of estuaries, coastal bays, and upstream areas of rivers for spawning and juvenile development make stocks vulnerable to habitat alterations in many areas (NatureServe 2012). Please note that this species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and threatened by the Virginia Department of Game and Inland Fisheries (VDGIF).

To minimize impacts to aquatic resources, DCR recommends the utilization of new technologies as they become available to improve water quality. Due to the legal status of the Atlantic sturgeon, DCR also recommends coordination with the U.S. Fish and Wildlife Service (USFWS) and Virginia's regulatory

authority for the management and protection of this species, the VDGIF, to ensure compliance with the Virginia Endangered Species Act (VA ST §§ 29.1-563 – 570).

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Gladys Cason (804-367-0909 or Gladys.Cason@dgif.virginia.gov).

Should you have any questions or concerns, feel free to contact me at (804) 692-0984. Thank you for the opportunity to comment on this project.

Sincerely,

Alli Baird

Alli Baird, LA, ASLA
Coastal Zone Locality Liaison

Cc: Amy Ewing, VDGIF
Troy Andersen, USFWS

Literature Cited

Burkhead, N. M., and R. E. Jenkins. 1991. Fishes. Pages 321-409 in K. Terwilliger (coordinator). Virginia's Endangered Species: Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

Gilbert, C. R. 1989. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic Bight) Atlantic and shortnose sturgeons. U.S. Fish and Wildlife Service Biological Report. 82(11.22). U.S Army Corps of Engineers TR EL-82-4. 28 pp.

Johnson, J. H., D. S. Dropkin, B. E. Warkentine, J. W. Rachlin, and W. D. Andrews. 1997. Food habits of Atlantic sturgeon off the central New Jersey coast. Transactions of the American Fisheries Society 126(1):166-170.

Marine and Coastal Species Information System. 1996. October 1-last update. Fish and Wildlife Information Exchange-VA Tech. Online. Available: http://www.fw.vt.edu/fishes/macsis.html.

NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: May 14, 2012).

Secor, D. H., and T. E. Gunderson. 1997. Effects of hypoxia and temperature on survival, growth, and respiration of juvenile Atlantic sturgeon, Acipenser oxyrinchus. Fisheries Bulletin 96:603-613.